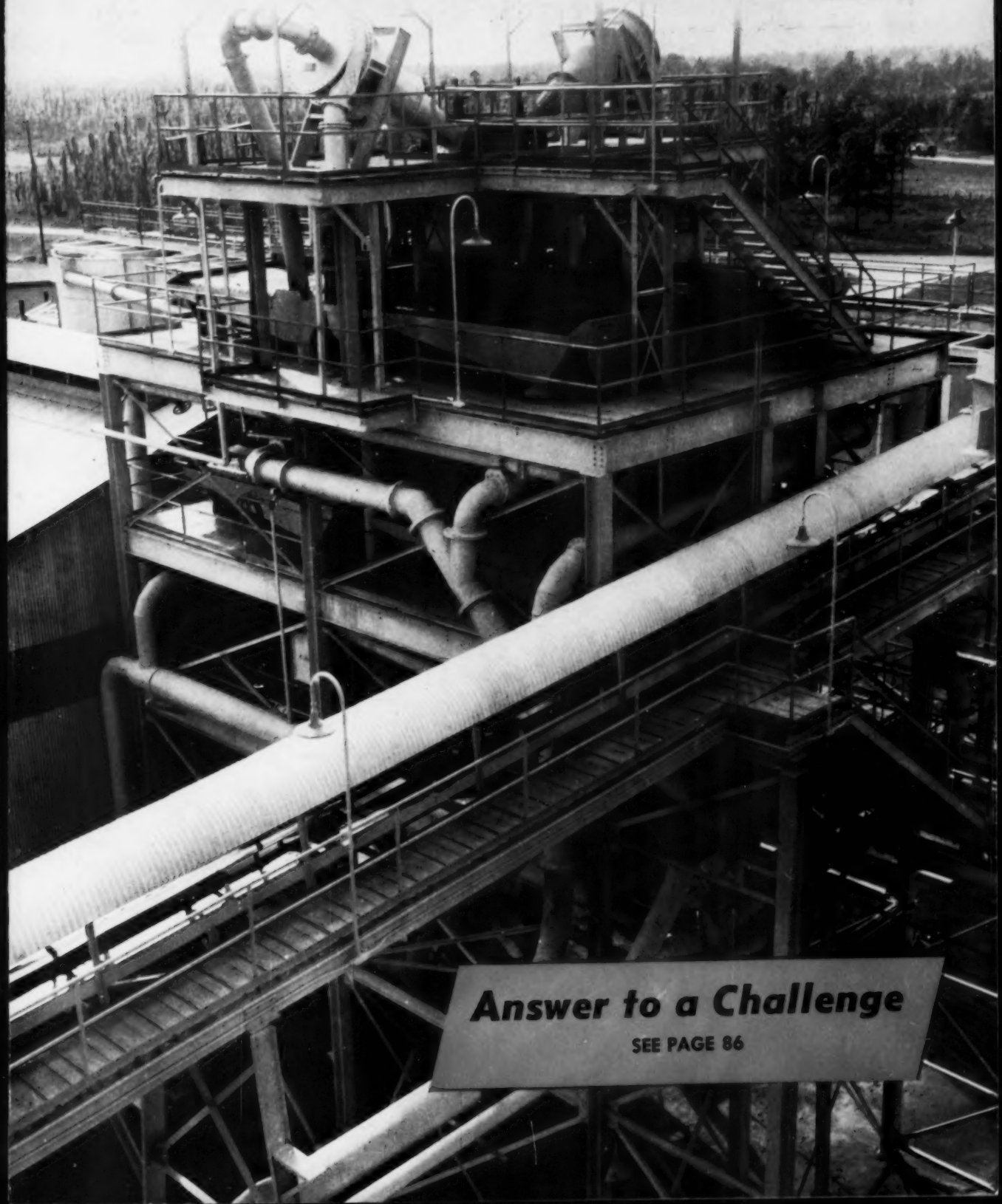
PIT and QUARRY

THE BASIC MAGAZINE IN A BASIC INDUSTRY

October 1959



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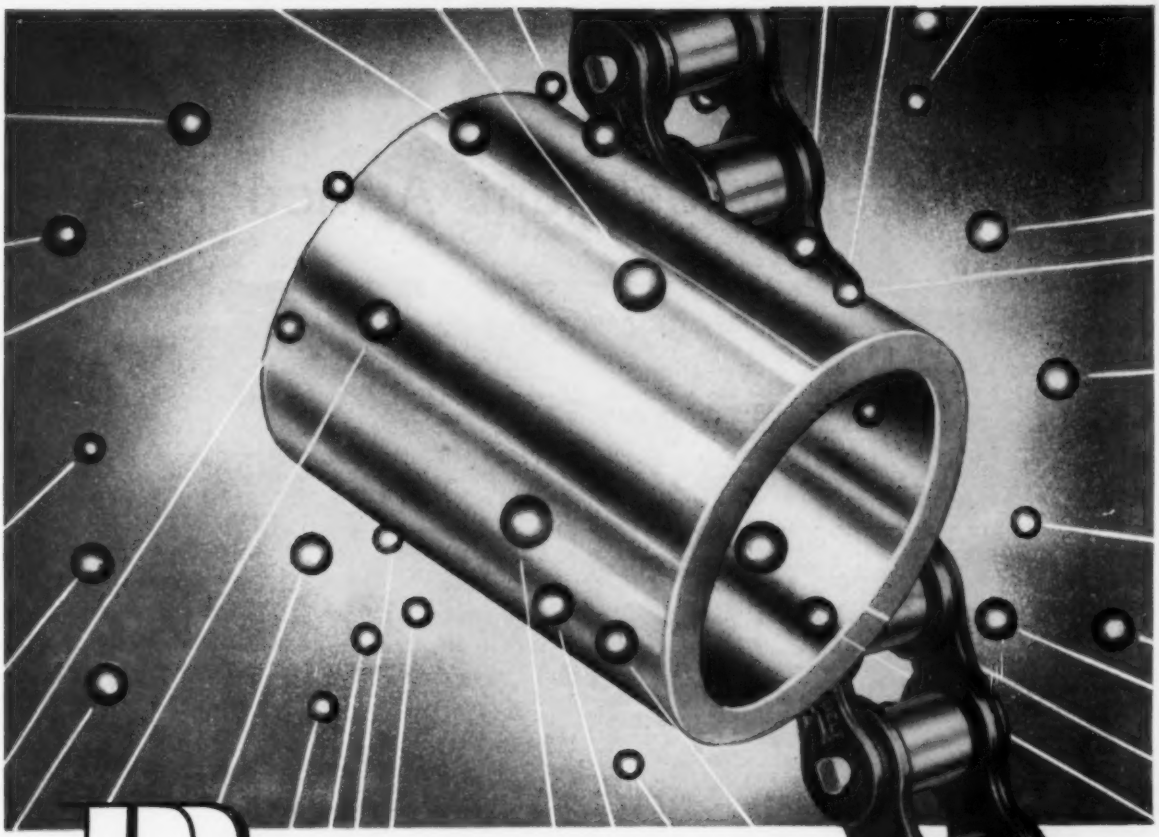

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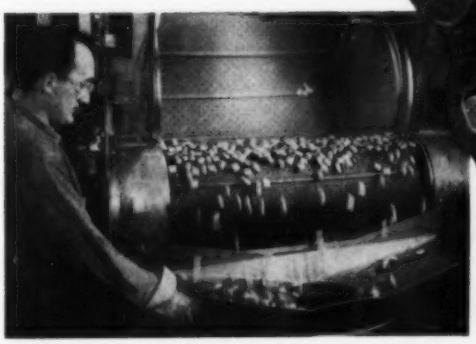

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PIT and QUARRY

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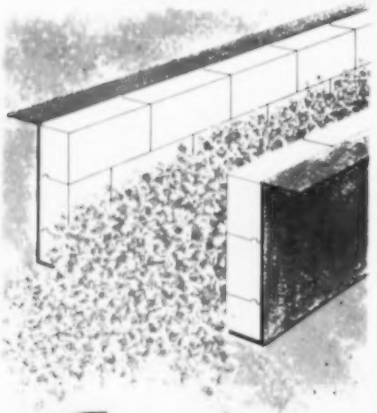

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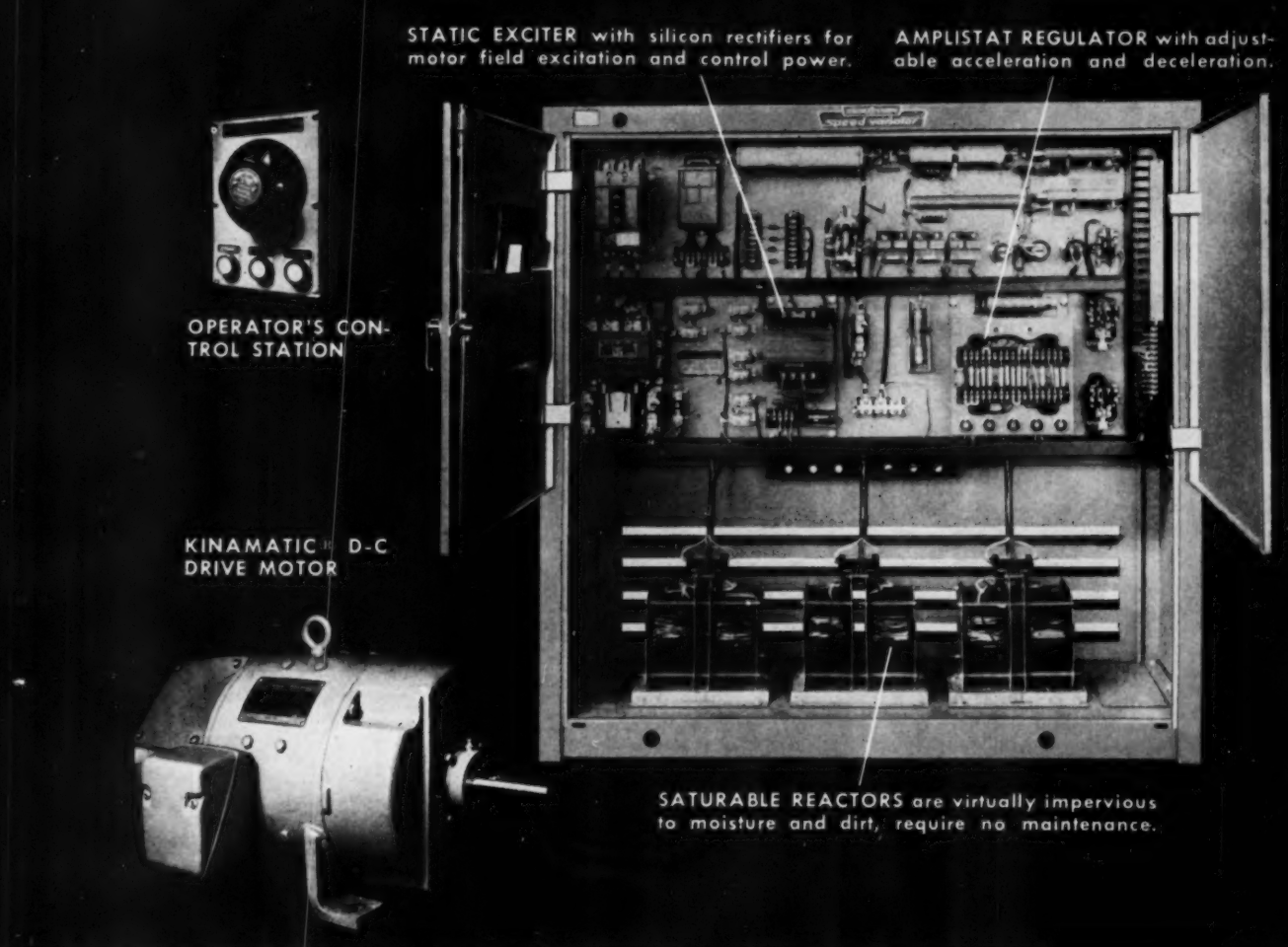
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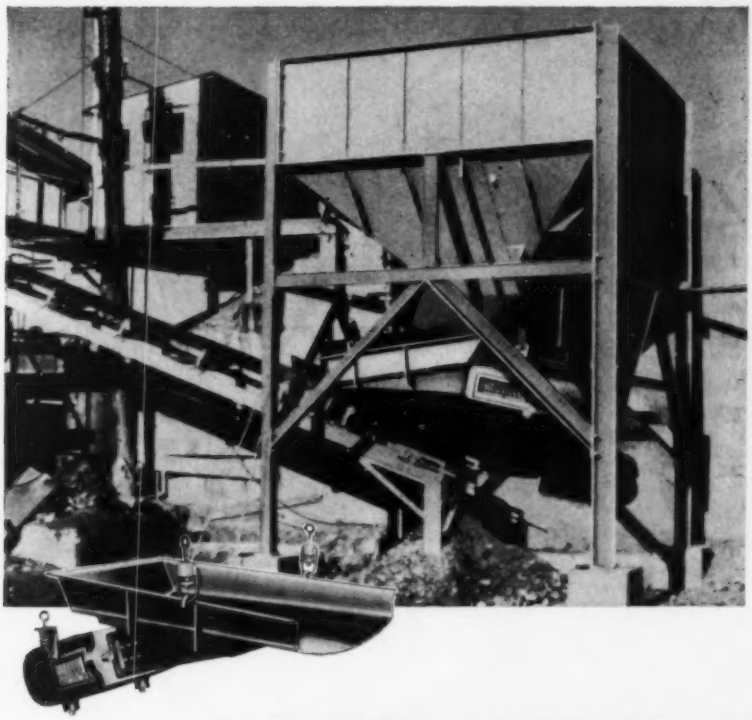

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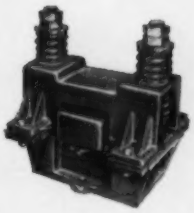

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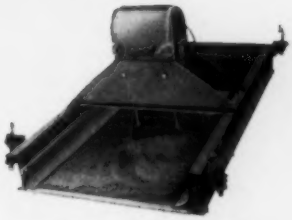

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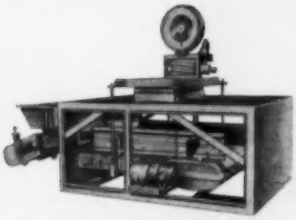

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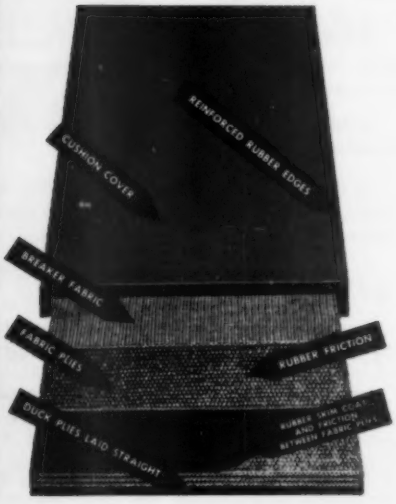

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Washington News Letter

By S. HERBERT UNTERBERGER

THE steel strike has forced into the focus of congressional consideration the question of how to prevent inflation generated by wage increases. While this problem will no longer be considered at this session of Congress, it is clearly on the agenda. It is a subject which was recently given careful consideration by leading economists at a conference sponsored by Columbia University.

In analyzing the various possible results of a bargained wage increase, Sumner Slichter, professor of Economics at Harvard University, concluded that the most common situation is one in which the demand for the product is inelastic; that is, when, as a result of a wage increase, selling prices are raised, the demand for the product will not fall at all or will fall by a smaller proportion than that by which the price was increased. "Under these conditions," he states without modification, "the wage increase is inflationary."

He concludes: "Trade unions as a rule do more than transfer income from some parts of the economy to others. They affect the size of the total flows of income, as well as the relative size of its components. At times, union settlements are deflationary—reduce the size of total income flows. More often the effect is inflationary—to increase the size of total income flows."

Finally, he asserts: "Our trade union movement has become a powerful income-generating instrument —a built-in source of demand for goods and of inflation."

When he asks, "What should be done about this tendency of unions?" he has no really new proposals, and his evaluation of the usual proposals, most of them from industry sources, is somewhat disheartening. He starts out by saying flatly, "An effort should be made to limit wage increases, as a general rule, to increases in output per man-hour." But, he admits, there is no known way of accomplishing this.

He reviews the suggested approaches as follows:

1. The suggestion that unions be deprived of some of their present extraordinary privileges, such as their use of coercive picketing or the conscription of neutrals in labor disputes.

In his evaluation of this suggestion he says, "These changes in the law are overdue but they would have little effect upon the outcome of most bargains."

2. The suggestion that unions be broken up so that there would be several in each industry.

His equivalent of this point is as follows: "Unions would lose some of their present ability to support strikes by some members while other members work and pay dues and special assessments." But there would be rivalries among the new unions, and each would feel a strong urge to make a better settlement than any of the others. Hence, there is little reason to expect that breaking up unions would, as a general rule, diminish their upward pressure on wages.

At the same session, Lloyd G. Reynolds, professor of economics at Yale, added to the list of suggestions as follows:

3. The suggestion that collective bargaining decisions be centralized among top union officials who, because of their better understanding of the national economic necessities, would presumably be more moderate in their demands.

His evaluation of this idea points out that there is no evidence from the European experience, where such decisions are highly centralized, that the results would be different. And, furthermore, he states the proposal is impracticable in the sense that a democratic government can do little to bring about greater centralization of wage discussions. Finally, he fears that all that would happen would be that supplementary local bargains would work upward from the national norms.

4. The suggestion that government should intervene in specific price and wage decisions.

In evaluating this suggestion, Professor Reynolds states that such intervention would be either ineffective or harmful. To be effective, it must be accompanied by certain sanctions, but this idea runs counter to our tradition of a private economy. Furthermore, the announcement of a target figure for a wage increase would imply that all wages should advance to the target, regardless of the wisdom of such a move in a particular company or industry.

As for remedial measures, Professor Slichter suggests a series of somewhat unrelated steps, including an expansion of inventions, thereby reducing the demand for labor; a broadening of the aims of trade unions, such as the Scanlon plan, through which unions benefit by increased output; and the removal of import duties and quotas. Finally, he does not expect these steps to be very effective, principally because scientific progress and inventions will create large profits in various parts of the economy. These profits will stimulate stiff wage demands; and the profitable firms will choose to concede much of what the

(Continued on page 72)

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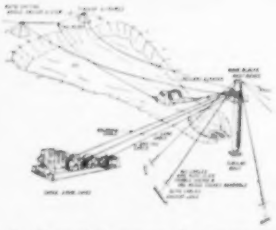

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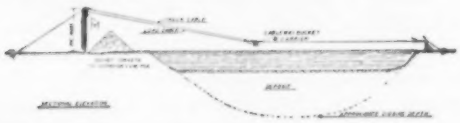
Crescent approaches hopper in front of tubular mast. Inset shows operator at hoist controls.

Deep Digging, Underwater Recovery— Conveying to High Delivery Point



This 1½-yd. Slackline Cableway is digging in 70 ft. of water and conveying to stockpile on an average haul of 600 ft.

When deep digging is required—or anticipated in the future—a Sauerman Slackline Cableway is the best machine. This powerful excavator can dig 100 ft. or more below water, lift its load and deliver to a high pile up to 1000 ft. away. This surge pile can be held in readiness for plant needs.

The bucket inhauls at high speed and dumps automatically. The dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point completing the fast operating cycle.

Sauerman Slackline Cableways range in size from ⅓ to 3½ cu. yds. Now available with torque convertor power, the Slackline is increasing its production over 25%.

Bucket automatically discharges onto a 60-ft. high cone pile. Mast in foreground rises 90 ft.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of sand and gravel excavating machinery experience. Ask for Catalog A (DragScrapers) and C (Slackline Cableways).

SAUERMAN BROS. INC. 634 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BLOCKS

Labor Developments

THE President asked for it and Congress did it—passed a new labor law which, added to those already on the books, is supposed to remedy the evils revealed by the long investigation of the McClellan Committee.

While this legislation was going through the congressional machinery, feeling about it ran exceedingly high. Business interests mounted an almost unprecedented drive to obtain passage of the Griffin-Landrum bill. The law finally passed does not differ very much from that bill. Organized labor, both the regulars in the AFL-CIO and the independents (Teamsters, Longshoremen, Mine Workers, etc.), did more lobbying against this bill than in connection with any other piece of legislation. No words were too harsh to be used in denouncing it.

The law passed on Friday, September 4, with Presidential signature certain. The following Monday was Labor Day. Of special interest is the fact that in the intervening week-end the let-down had already begun. In the interim, there was apparently a good deal of careful reading of the law that had been passed, and some thinking was done about its effectiveness.

Pro-business analysts were less sure that it would solve many of their problems; and the trade unions were less sure that they had suffered a very serious blow. In Labor Day speeches union leaders still complained about the unfair treatment received at the hands of a Congress which they had been instrumental in electing; but the pre-passage fire was gone.

A consideration of what the new law really contains will explain much about this change of attitude.

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

First of all, there are the so-called union reform provisions, designed principally to clean up the Teamsters Union. There was no real conflict about these provisions. For the most part, they had been cleared with the officials of the AFL-CIO by Senator Kennedy. To be sure, the Teamsters would have preferred not to have them enacted into law but even they recognized the inevitability of such legislation.

Hereafter, unions must file regular financial reports in a form generally prescribed by the government. They must disclose, and therefore they will have to regularize, many of their internal procedures. Former convicts are barred from office for some period of time. Loans made by a union to its officers must, except in rather insignificant amounts, be revealed. A so-called "bill of rights" for union members provides relief through the courts if they are denied freedom of speech and other elementary rights. Regular and reasonably frequent elections by secret ballot are required.

All these are, no doubt, useful safeguards for union members, but only if they are *used*. As many a negligent stockholder has discovered, the publication of financial reports is not much of a safeguard if those reports are not carefully scrutinized by analysts who understand their intricacies. Similarly, freedom of speech is of no value to a union member who doesn't bother to attend meetings.

This part of the legislation has done more than merely to assure to all union members the rights which the members in the best unions already have. To be sure, most unions have long required elections by secret ballot, have issued detailed financial reports, etc. The difference now is that these requirements, plus a large number designed to provide internal trade democracy, are now externally improved *as a matter of law*.

Many responsible union officials are concerned over the possibility that certain irresponsible elements in the union, such as the Communist fringe or crack-pots, will threaten to use, or actually use, these legal avenues to create disorder.

Employers also are becoming less certain that full internal union democracy is such a good thing, after all. They are discovering that the elected union leaders with whom they have been dealing peacefully for some time have already become less secure in their jobs, and that under this legislation they may become quite insecure. The result is that union leaders respond to more pressures upon them and may become harder to deal with. Many employers, having discovered this problem, are concerned about the possibility that the law which they helped to pass may do them more harm than good.

Turning to the more controversial aspects of the law — the ones about which hordes of lobbyists, for and against, descended on Washington—second thoughts are beginning to suggest that these, too, are a "pretty weak dish of tea" and that, in some circumstances, they may be more harmful than beneficial.

First, there is the elimination of the so-called "no man's land," which means that state courts and labor boards are now authorized to take jurisdiction over cases declined by the National Labor Relations Board, principally because the

(*Continued on page 72*)

When you've got a tiger of a job by the tail and every extra trouble-free turn of your wheels means money in your pocket, you need stronger, NYGEN®-built

GENERAL TRUCK TIRES

. . . the astounding tires that have proved their worth haul after haul . . . job after job!

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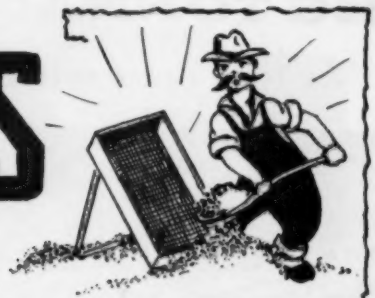
SCREENINGS



By RAY L. SMITH JR.

"DEAR BOSS," read the letter from a newly-recruited salesman, "I seen this outfit which they ain't never bot a dime's worth of nuthin from us, and I sole them a couple hundred thousan dollers wurth of goods. I am now goin to Chiaugo."

Two days later the sales manager received a second letter from the same salesman: "I came hear and I sole then haff a milyon."

The following day the sales manager sent letters to every member of his sales force. Enclosed were copies of the other letters: "We been spendin two much time hear tryin to spel instead of tryin to sell. Lets watch those sails. I want everybodie should reed these letters from Gooch who is on the rode doin a grate job for us and all you should go out and do like he done."

Dark Is The Moon

COMRADE I. Manooduik lifted one corner of the Iron Curtain today to disclose that Nikita Khrushchev and official party were shocked by the "open display of sex-mindedness on the part of the country." Asked what he meant specifically, he said, "As the Kremlin leader and party drove along the highways it confronted them again and again. First it was 'Soft Shoulders'; 'Dangerous Curves'; 'Five gals for $1.00'; 'Try Ethyl'; and finally. 'Watch Out For Children'." Those Russians—what will they think of next?

For ordinary purposes the moon is just a little off our editorial beat, but we can't resist adding a brief footnote to the recent flurry of publicity received by our nearest neighbor in the solar system. Unconfirmed as yet is the rumor that Nikita has given the "Man in the Moon" thirty days to, "get lost."

Now look, Nikita, let's not have any *more* such nonsense. About all we belabored and retreating males have left is the nocturnal instruction received during those free classes offered by "Mr. Moon."

Potpourri and Succotash

"The Book-Lover's Club had its first fall get-together with the husbands of the members at dinner Thursday evening. Following the dinner the group went to the home of a member to watch television."

A woman telephoned from her room in the New York Statler to ask what was the check-out hour and they told her three o'clock. She said she couldn't stay that long because her bus was leaving at one. Another woman asked the desk how much weight she could take on a plane. When they told her forty pounds she said she weighed more than that.

Guests hide money in the bedclothing, wastebasket, toilet, chandelier, between pages of the telephone book, and in the Gideon Bible. Often they forget where they hid it, or leave without remembering it until they are safely home, five hundred miles away.

To thwart hotel help who they think will rob them, some guests set rattraps in bureau drawers, and forgetfully catch their own fingers.

Occasionally germ-conscious middle-aged ladies ask the elevator operators to take them up and down alone so they can avoid other guests, who are germ-laden.

A report having been received that a man had an unregistered guest in his room, an assistant manager called the man and asked if his guest was a lady.

'Hold the line,' said the extrovert, 'and I'll ask her.'

As a switch, would a box of a dozen bars of Dial soap be accepted by a lady friend in the spirit in which it was given?

An Indian petitioned a judge of an Arizona court to give him a shorter name.

"What is your name now?" asked the judge.

"Chief Screeching Train Whistle," said the Indian.

"And to what do you wish to shorten it?" asked the judge. The Indian folded his arm majestically and grunted, "Toots."

Smith: 'Hullo, old chap, you're looking very tired this morning. What's wrong?'

Jones: 'Well, it's like this. I snore so loudly that I wake myself up, and I don't know what I can do about it,'

Smith: 'Why don't you try sleeping in another room?'

The shelves of a book publisher were crowded with a certain novel which, in spite of a lurid dust jacket and an even more lurid story-theme, simply refused to sell more.

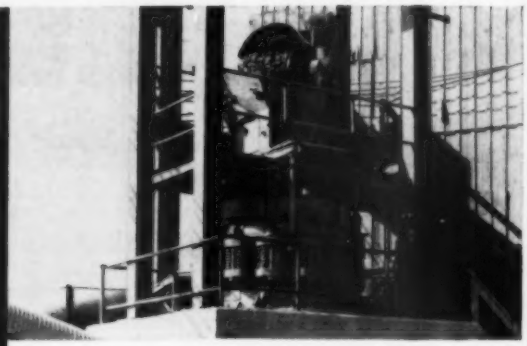
Just as the proprietor was on the point of giving it up as a bad job, and consigning it to the pulping people, his second-in-command suggested that they have one last stab at selling it by placing the following ad in the "personal" section of the local paper:

"Millionaire, young, good-looking, wishes to meet, with a view to marriage, a girl like the heroine in X's novel."

Within twenty-four hours, a mob of husband-hungry females descended on the bookstores and snapped up every available copy.

The biggest trouble with success these days is that its recipe is just about the same as that for having a nervous breakdown.

BIG TONNAGES of quality aggregate produced at low cost with SYMONS® Cone Crushers



for STATIONARY service . . . Symons Cone Crushers are built in Standard, Short Head, and Intermediate types, with crushing heads from 22" to 7' in diameter—in capacities ranging to 900 or more tons per hour, for primary, secondary and finer reductions.

for PORTABLE service . . . Symons Cone Crushers are being used in increasing numbers for portable and semiportable crushing plants. Illustrated is a typical Cedarapids® Intermediate Scalping Unit, using a 4-ft. Symons Cone Crusher. Unit is serving a large Midwest sand and gravel producer.

Typical of today's modern highway construction is this view of the modern Freeway in Oakland, California, showing three levels of highway structure over two levels of railroad.
(Photo courtesy California Division of Highways)

C-159

The big tonnages of specification aggregate, bituminous mixes, crushed sand and cement required to meet the ever-increasing needs of the construction industry are produced by Symons Cone Crushers at low cost. Good reasons why these efficient crushers are the leading choice of producers and contractors building highways, dams and hydro projects, bridges, as well as commercial building construction.

It will pay you to specify and use Symons Cone Crushers for both stationary and portable service. *Write for descriptive literature.*

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG MACHINERY

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SYMONS . . . a registered Nordberg trademark known throughout the world

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
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Which is the Best Screen for your job?

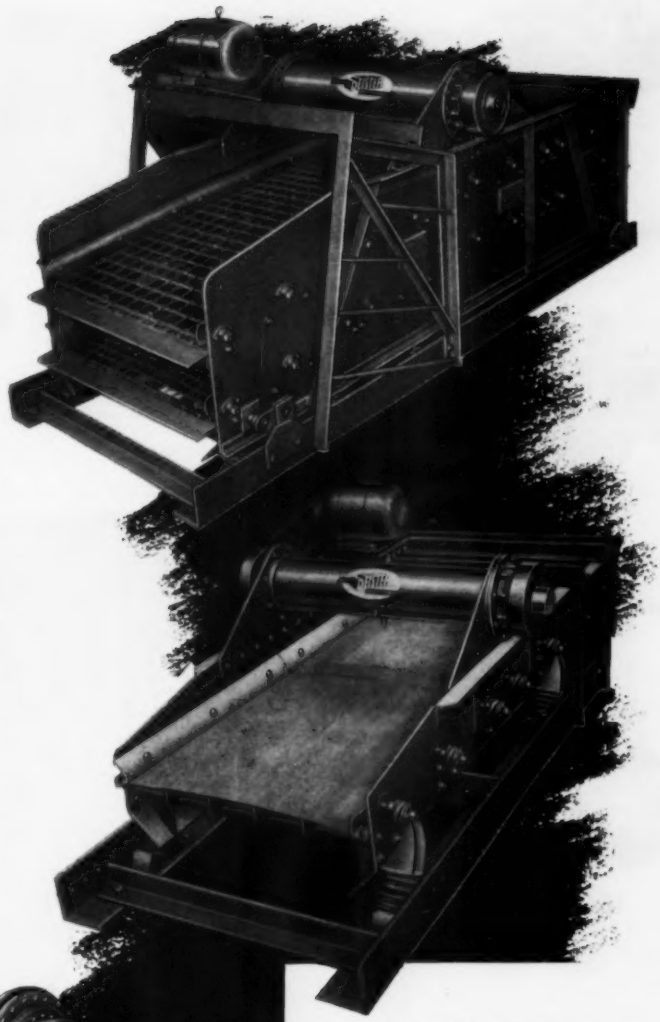
The vibrating screens you select to meet today's extremely competitive conditions must be highly specialized machines . . . designed especially to handle each of *your particular jobs*. And that's why Deister builds screens in four distinct *types* and in a complete range of *sizes*. For example:

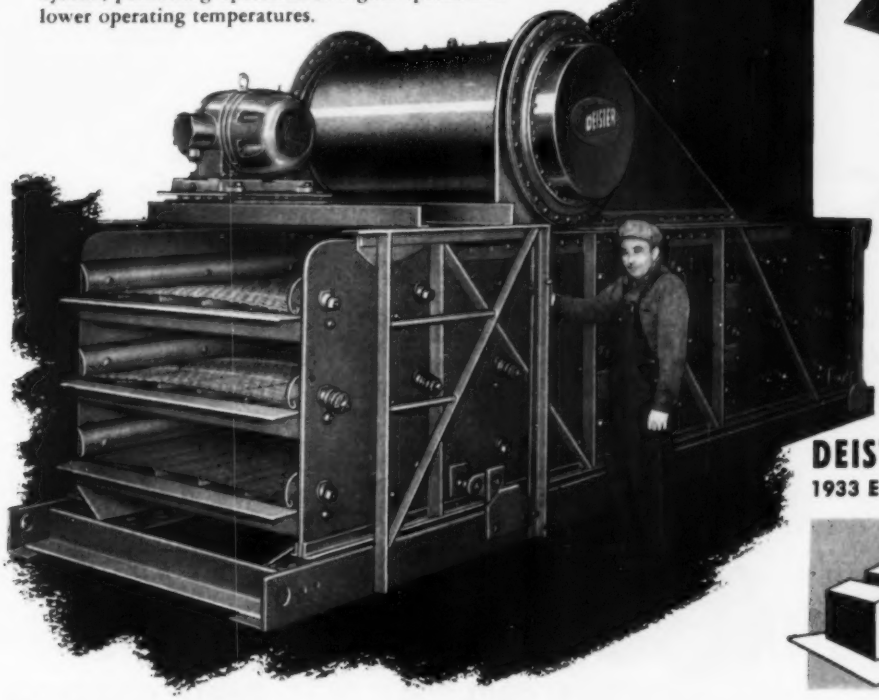
Type UHS. Deister Type UHS Screens are built in a full range of sizes to meet any heavy-duty screening job. Extra heavy-duty types are available for scalping and coarse sizing. The Deister principle of opposed elliptical throw provides maximum capacity and efficiency in sizing. With Deister's exclusive Adjustable Slope Screen Panels, the screening angle of every Type UHS may be adjusted exactly at both feed and discharge ends to meet the specific requirements of your job.

Ag-Lime. Deister Ag-Lime Screens (Type USL) are designed to screen damp, sticky material through medium and medium fine screen cloth openings. They apply intense vibration at a relatively high frequency. For unusual conditions they are available with an Electric Screen Heater and a Ball Tray Deck.

Flat Screens (Type UF). If your plant design requires flat or horizontal screens, or if you need increased tonnage but lack the head room necessary to install larger inclined screens, investigate Deister Type UF Screens. They are also unusually effective for dewatering sand, gravel and stone.

An outstanding feature of *all* Deister Vibrating Screens is Deister's Exclusive Oil Mist Lubricating System, permitting operation at higher speeds and lower operating temperatures.





Top: Type UHS Screens are available in 3', 4' and 5' widths; in 10', 12', 14' and 16' lengths; and with single, double or triple decks.

Above: Type USL Ag-Lime Screens are built in 4' x 8' and 4' x 10' single-deck models.

Left: Type UF is built in 3', 4' and 5' widths; in 8', 10', 12', 14', 16' and 18' lengths; in single, double, triple and four-deck models.

DEISTER MACHINE CO.
1933 E. Wayne St., Ft. Wayne, Ind.

DEISTER

YARDS ON

MODEL CW-220
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CW-215
15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT

MODEL CW-27
7.0 cu. yds. STRUCK
10.0 cu. yds. HEAPED

MODEL CW-226
26.0 cu. yds. STRUCK
36.0 cu. yds. HEAPED

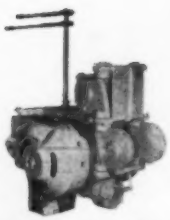
MODEL CW-320
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CWD-221
21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY
INTERCHANGEABLE WITH MODELS:-CW-220

INTERCHANGEABLE WITH MODEL CW-320 SCRAPER UNIT

MODEL CWD-321
21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY

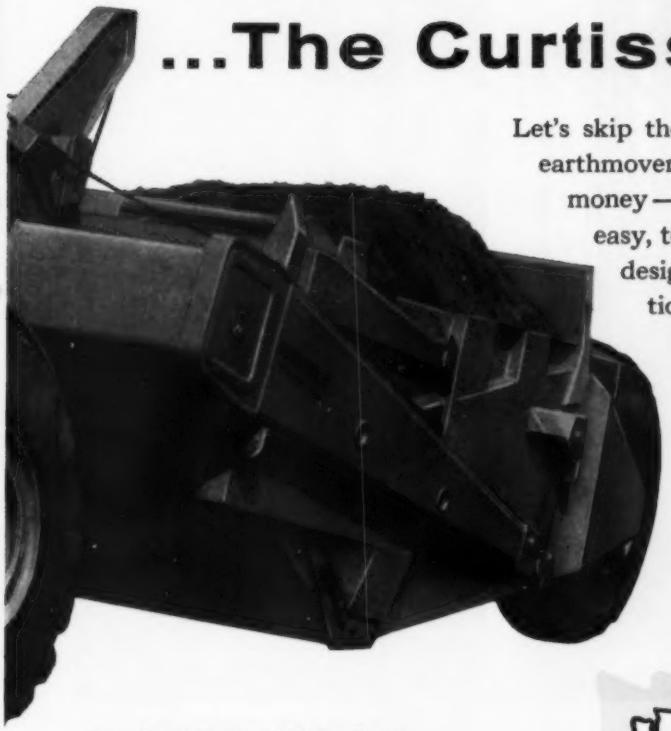
MODEL CWT-20
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED



CABLE CONTROLS
for standard tractors in every horsepower range

AHEAD

OPEN PIT EXCAVATION ...The Curtiss-Wright Line



Let's skip the details and get down to basic facts about earthmovers. If you move more dirt, you make more money — it's as simple as that . . . and just about as easy, too, with the modern Curtiss-Wright line. C-W design features for high performance, easy operation and low maintenance put you yards ahead in production — dollars ahead in profit on any earthmoving job. Call your Curtiss-Wright distributor for complete information and specs on the machine performance matched to your job requirements.

Your local Curtiss-Wright distributor is part of a nationwide sales, parts and service network devoted to making Curtiss-Wright users the most satisfied in the industry. You can depend on him for the most efficient, most cooperative service that it is possible to provide.

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Enter 18 on card, page 155

Truck-mounted REICHdrill Model T-750.

REICHdrill Model T-450 drilling coral.

IN QUARRYING OPERATIONS

REICHdrills give you MUCH more hole per day

And here are 4 rugged reasons why:

1. Variable rotation speed gives you exactly the right RPM for any material, rock to rubble.
2. Minimum of control levers for all operations means fast, easy handling by one man.
3. All controls actuated by smooth hydraulic power, saving operator time and tiring.
4. Extra heavy-duty construction on all component parts, including pumps, gears and frame means rig can take long, high speed duty without costly maintenance. Plus other field-proven features like hydraulic stem loader and down-the-hole hammer.

Units can be supplied truck or crawler mounted to suit operating conditions. Holes up to 12″ diam. Down pressure to 75,000 lbs. Write for detailed information on REICHdrills.

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Division: Chicago Pneumatic Tool Company

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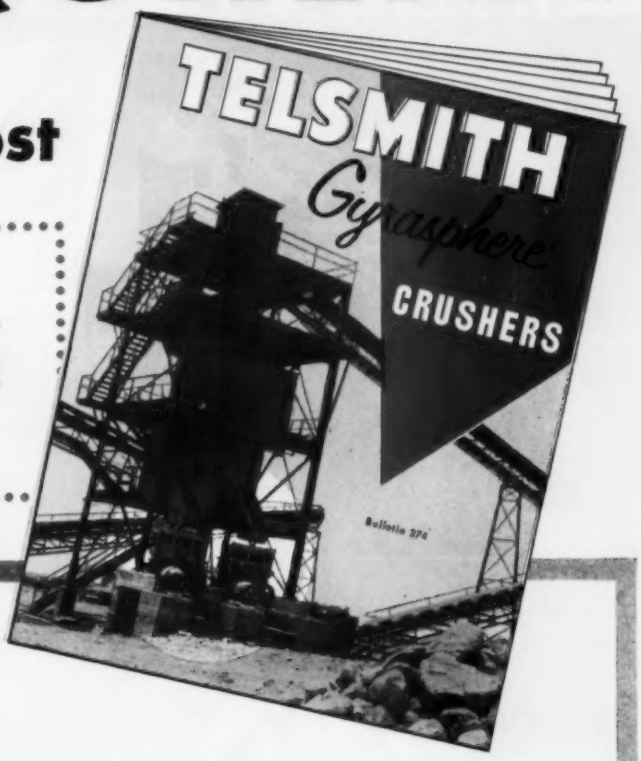
TOP QUALITY

Aggregates at Lowest Cost

Get this
NEW BOOK
it tells how



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Your secondary crusher, coarse or fine, must be easy to feed . . . turn out highest capacity . . . meet today's strict specifications. Get all this with modern Telsmith Gyraspheres, plus low power needs and low cost upkeep that gives you *lowest cost per ton*—for more and better aggregate at a greater profit. *How?* . . . get Bulletin 274.

NOW MADE IN FOUR SIZES—
24", 36", 48", and the NEW 66"
. . . for Coarse and Fine Crushing

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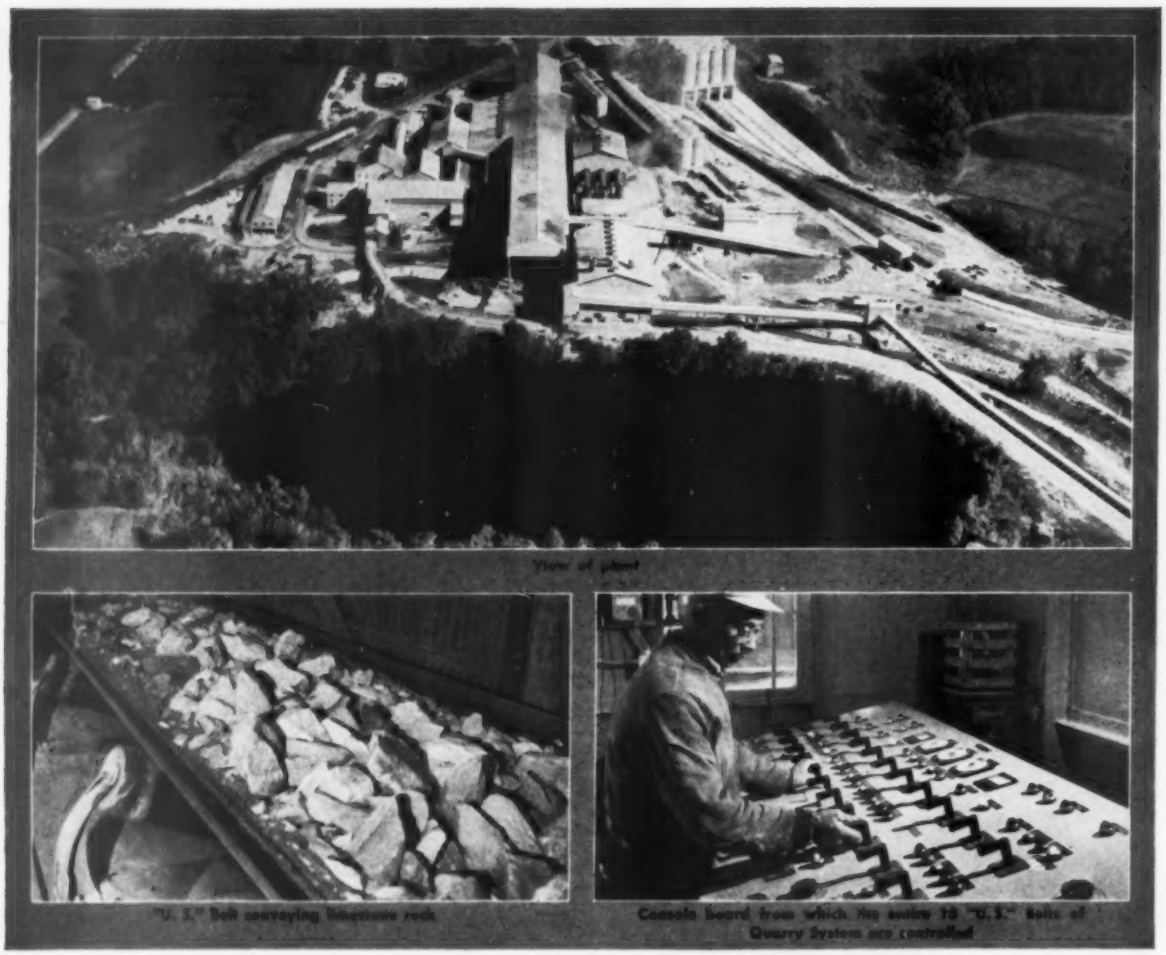
US RUBBER CONVEYOR BELTS



View of plant

"U. S." Belt conveying limestone rock

Console board from which the entire 10 "U. S." Belts of Quarry System are controlled

Lehigh Portland's Union Bridge plant Highly Conveyorized

This immense plant in Maryland has a capacity of 3-million barrels per year. To feed its huge, ever-hungry machinery, the crushed limestone, sandstone and shale are carried on an automatic conveying system, with rubber belting made by "U. S.".

The entire system is so trouble-free that one operator (plus an oiler-helper) controls a series of 10 of the "U.S." Belts from console board at the quarry.

The main belt in the system is a 5-ply CX U. S. Matchless;® 3560' long on 1780' centers, 36" wide.

It carries 600 tons of raw limestone per hour, extends from the quarry to a transfer belt which runs to the storage building.

Coal and gypsum are brought nearly 500 feet to storage by one of the belts in another conveyor system. Being separate from the conveyor handling limestone, either gypsum or coal can be conveyed to storage at any time.

Massive as this Lehigh plant is, provision for expansion has been designed into the conveyor systems. The superior troughing and stamina of "U. S." Belts enable them to handle greater loads if capacity is increased.

The reliability of "U. S." Belts demonstrated in this plant is one reason why United States Rubber is the world's largest manufacturer of conveyor belts.

• • •

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

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Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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News of the Industry

Dewey Portland Cement To Beccme a Division Of American-Marietta

Under a stock-exchange plan approved by the directors of 53-year old Dewey Portland Cement Company and 46-year old American-Marietta Company, the former will become an independent division of A-M. Final transactions for the pooling of business and assets will be completed upon approval by Dewey stockholders. The transaction is estimated to have a current market value of about $65 million.

Dewey's operations will continue under F. E. Tyler, chairman, and Waldo E. Tyler, president, who is slated to become a member of the board of directors of A-M.

Enlargement of A-M's cement plant at Martinsburg, W. Va., was completed in August, boosting A-M cement production capacity by 1,400,000 bbl. annually. Dewey's annual capacity of portland cement should total 7,200,000 bbl. upon completion of its $12,000,000 Tulsa, Okla., plant. The acquisition of Dewey will extend A-M's cement operations into the Midwest and give that company a yearly productive capacity of 21,000,000 bbl. from four cement operating divisions. (The other divisions are Standard, Dragon, and Southern.)

New Oklahoma Cement Company Awards Contract for Silos

A contract has been awarded by Oklahoma Cement Co. to Macdonald Engineering Company, Chicago, for the design and construction of three raw material blending silos and six finished cement storage silos for the new $6,500,000 Oklahoma Cement Company plant now going up at Pryor, Okla. (See PIT AND QUARRY, August. 1959, p. 24.) Construction of the silos was begun in September and will be completed within five months.

The raw material silos are 32 ft. inside diameter by 48 ft. deep, with flat bottoms and aeration pads to homogenize the raw material for a complete mixture of kiln feed. The cement storage silos are 33 ft. in diameter by 131 ft. in height with steel cone hopper bottoms discharging into an Airslide-bucket elevator system for loading into bulk cars and trucks.

The contract was awarded by George A. Fuller, general contractor and engineer on the job, and A. J. Anderson, consulting engineer.

U.S. Gypsum Co. Prepares To Open Deep Mine At Sperry, Iowa, in 1960

The first piece of gypsum ore from U. S. Gypsum Company's Sperry, Iowa, mine was raised 600 ft. to the surface recently.

Although regular mining operations have not begun, about 15,000 tons of gypsum will be removed through the ventilating shaft as miners dig a tunnel connecting with the main shaft.

The Sperry operation reportedly will be one of the deepest gypsum mines in the country.

Coming Events

October 11-16, 1959—San Francisco. Third Pacific Area national meeting, American Society for Testing Materials. Sheraton-Palace Hotel.

October 19-23, 1959—Chicago. 47th National Safety Congress. Mining Section sessions, Congress Hotel. Headquarters, Conrad Hilton Hotel.

October 29-30, 1959—Boca Raton, Fla. 42nd Annual Meeting, National Slag Association. Boca Raton Hotel and Club.

1960

January 18-21, 1960—Cincinnati, Ohio. 58th Annual Convention, American Road Builders Association. Netherland Hilton Hotel.

January 18-21, 1960—Washington, D.C. Board of Directors meeting and Annual Convention, National Limestone Institute. Statler-Hilton Hotel.

January 28-29, 1960—Roanoke, Va. Annual meeting, The Expanded Clay and Shale Association. Hotel Roanoke.

February 1-5, 1960—Chicago. Committee Week, American Society for Testing Materials. Hotel Sherman.

February 15-19, 1960—Chicago. Combined Biennial show, joint convention, National Sand and Gravel Association, and National Ready-Mixed Concrete Association. The Coliseum, and Conrad Hilton Hotel.

February 22-24, 1960—Chicago. 43rd Annual Convention, biennial manufacturers division exposition, National Crushed Stone Association. Conrad Hilton Hotel.

February 22-24—Los Angeles. 40th Annual Convention, National Concrete Masonry Association. Hotel Statler.

Future Building Contracts Top $22,000,000,000— Set All-Time July Record

Contracts for future construction in the United States in July rose to $22,511,353,000, a new all-time high for the month, rising slightly above the July record set last year, according to F. W. Dodge Corporation. Impressive gains in single-family houses, together with increases in all nonresidential building types, boosted construction contracts in July, 1959, to $3,656,537,000, up one percent from 1958.

Although housing once again sparked the increase, probably the most noteworthy feature of the July contracts was the very strong showing in the nonresidential category.

Contracts for residential buildings in July totalled $1,689,833,000, an increase of 9 percent over the same month last year. Chiefly responsible for the gain was a 19 percent rise in contracts for single-family houses. The total number of dwelling units represented by the residential contracts was 125,562.

Nonresidential contracts in July were valued at $1,190,941,000, up 11 percent over July, 1958. All nonresidential building types registered increases over a year ago, led by sharp gains in contracts for manufacturing, commercial, and religious buildings.

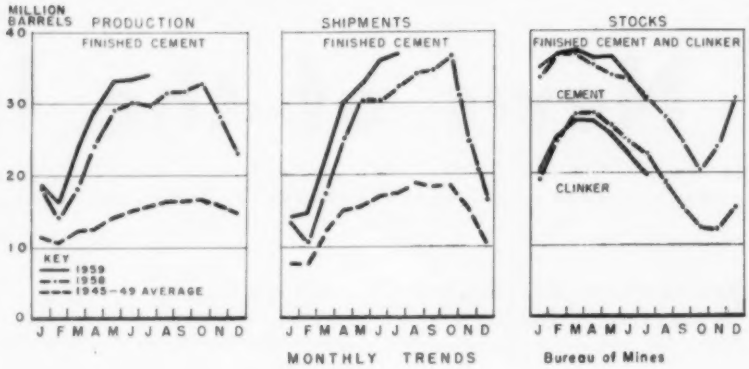
Contracts for heavy engineering construction in July amounted to $775,763,000, down 20 percent from the July, 1958, level. Despite some gains in contracts for electric light and power systems and sewerage systems, both public works and utilities fell below last year.

Cumulative totals of contracts for the first seven months of 1959, with percentage changes from the corresponding period of last year, are as follows: nonresidential buildings at $6,895,948,000, up 5 percent; residential buildings at $10,569,533,000, up 31 percent; heavy engineering at $5,045,872,000, down 12 percent; and total construction at $22,511,353,000, up 11 percent.

The Czechoslovak news agency Ceteka has reported the quarrying of what is believed to be the biggest block of granite ever cut in a mine. The scene was the Tisa quarry, in western Bohemia. The block has a volume of 180 cu. yd.

Ash Grove Lime and Portland Cement Company recently became an electricity customer of City Utilities at Ash Grove's Springfield, Mo., plant. The plant formerly generated its own electricity with diesel generating equipment. The move was made to take advantage of low industrial electric rates.

Duval Sulphur and Potash Company, Houston, Tex., has authorized capital expenditures this year of some $6 million for mining and milling of its products, which include sulphur and potash. The firm has operations in Texas, New Mexico, and Arizona.



—— July, 1959, Finished Portland Cement ——

SUMMARY—Production of finished portland cement in July, 1959, as reported to the U. S. Bureau of Mines, totaled 34,182,000 bbl., an increase of 15 percent over July, 1958. Mill shipments in July, 1959, totaled 37,046,000 bbl., an increase of 15 percent over July, 1958. Stocks of 30,417,000 bbl. of finished portland cement on hand were 1 percent lower than those on hand July 31, 1958. Clinker production during July, 1959, totaled 31,292,000 bbl., an increase of 11 percent over the July, 1958, figure.

PRODUCTION—One hundred sixty-eight (168) plants in 38 states and Puerto Rico reported a production of 34,182,000 bbl. of finished portland cement during July, 1959, compared with 29,833,000 bbl. produced in July, 1958.

Production of clinker during the month of July, 1959, was 31,292,000 bbl., compared with 28,240,000 bbl. during the same month last year.

High-early-strength portland cement in July, 1959, totaled 1,052,000 bbl., an increase of 16 percent over the July, 1958, production.

Prepared masonry cement production in July, 1959—1,590,000 bbl.—increased 22 percent over the July, 1958, production.

SHIPMENTS—Mill shipments of finished portland cement for July, 1959, totaled 37,046,000 bbl., compared to 32,281,000 bbl. in July, 1958.

In July, 1959, shipments were higher in 21 districts and lower in 2 districts than in July, 1958. The greatest increases were in the eastern Missouri-Minnesota-South Dakota, Georgia-Florida, and Ohio districts.

Mill shipments of high-early-strength portland cement totaled 1,315,000 bbl. in July, 1959, an 18 percent increase over the 1,113,000 bbl. shipped in July, 1958.
clinker on hand July 31, 1959, totaled 19,880,000 bbl., a decrease of 12 percent from the

Mill shipments of prepared masonry cement in July, 1959, totaled 1,677,000 bbl., an increase of 14 percent over the 1,476,000 bbl. shipped in July, 1958. Over one-half of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-lb. barrels although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 30,417,000 bbl. of finished portland cement were on hand July 31, 1959, a decrease of 1 percent from the 30,646,000 bbl. on hand July 31, 1958. Stocks of clinker on hand July 31, 1959, totaled 19,880,000 bbl., a decrease of 12 percent from the 22,561,000 bbl. on hand July 31, 1958.

FIRST SEVEN MONTHS OF 1959—For the January-July period of this year, the volume of production of finished cement amounted to 189,801,000 bbl., compared with 163,579,000 bbl. for the same period last year. Total shipments (Jan.-July, 1959) were 188,467,000 bbl., compared with 160,319,000 last year.

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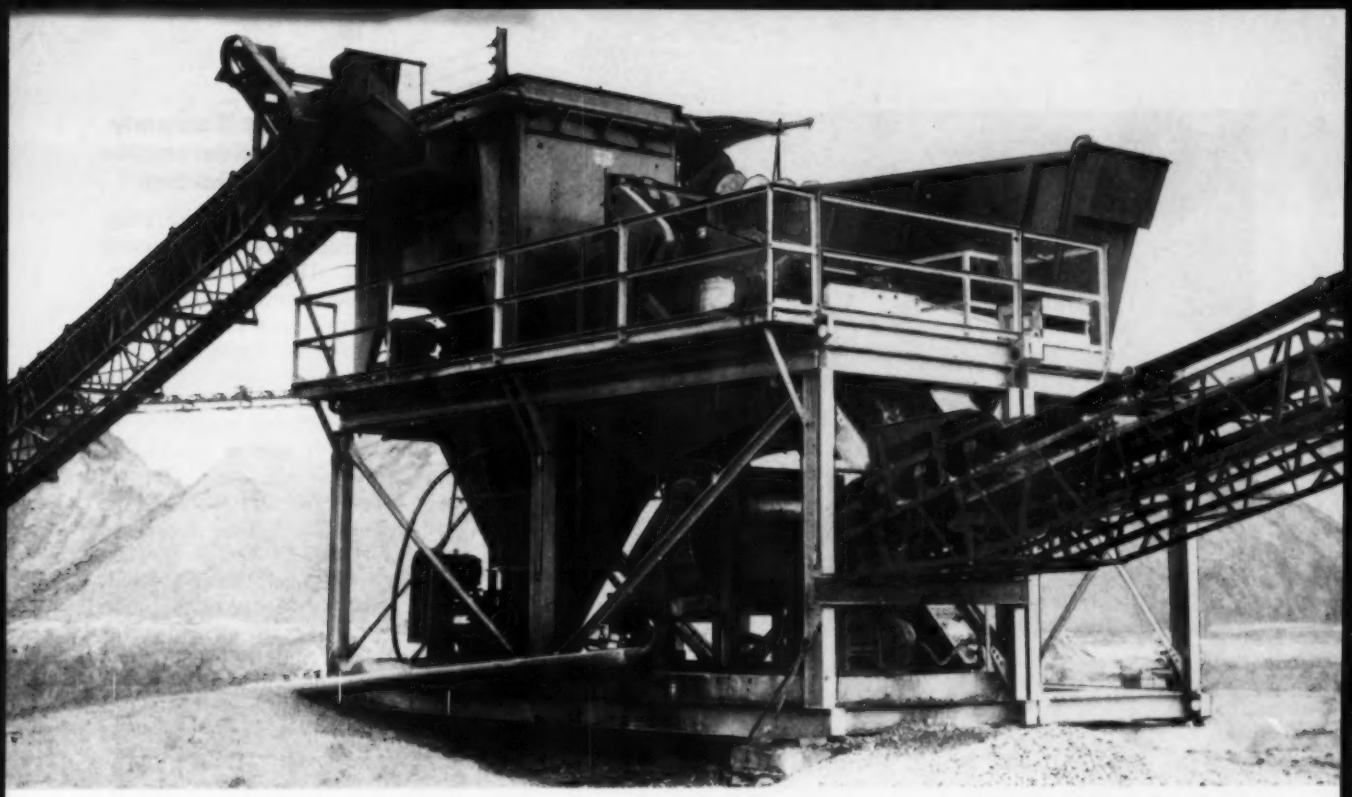

"OUR EAGLE HMS PLANT has solved our chert and soft stone problem"

GILLISSE CONSTRUCTION CO., GRAND RAPIDS, MICH.

To eliminate soft stone and chert from their class B material, to meet Michigan State Highway Dept. specifications, Gillisse Construction Co. uses an Eagle Heavy Media Separation Plant of 50-t.p.h. capacity. Ted Zeeff, Vice Pres., reports "It has solved our chert and soft stone problem. We are pleased with its efficiency and economy. The operator likes its ease of operation."

The Eagle HMS Plant is processing Michigan 6B material (⅜" to 1½") for bridge and overpass construction and 10B (⅜" to 1") for pre-stressed concrete bridge girders. This specification permits only 3% or less of deleterious material. Gravel treated by the Eagle HMS Plant readily meets specs. Sink or beneficiated material runs about 90% and float or rejected material runs about 10%. Rejected material is sold to secondary markets.

The highly efficient O.C.C. separatory vessel used in the Eagle plant will make a float-sink separation on materials with as little as 0.02 difference in specific gravity. If heavy media separation is the answer to your problem, this new high in separating efficiency allows the type of control needed to meet the really tough specification without unnecessary wastage of "good" material.

Gillisse Construction Company, successful aggregate producers for some years, also praises the splendid performance of their Eagle Coarse Material Screw Washer-Dewaterer which processes pea gravel (—⅜"), their Eagle Double Log Washer handling partially crushed gravel, and their Eagle Fine Material Double Screw Washer-Classifier-Dehydrator which handles concrete sand (2NS).

If soft stone or chert is hindering your sales an Eagle HMS Plant can solve your problem. Send a laboratory sample of your material for test—know why before you buy! Send for literature.

From the washing, screening plant in background, ⅜" to 1½" gravel is fed by dump truck to feeder and conveyor to the Eagle HMS Plant in foreground.

EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

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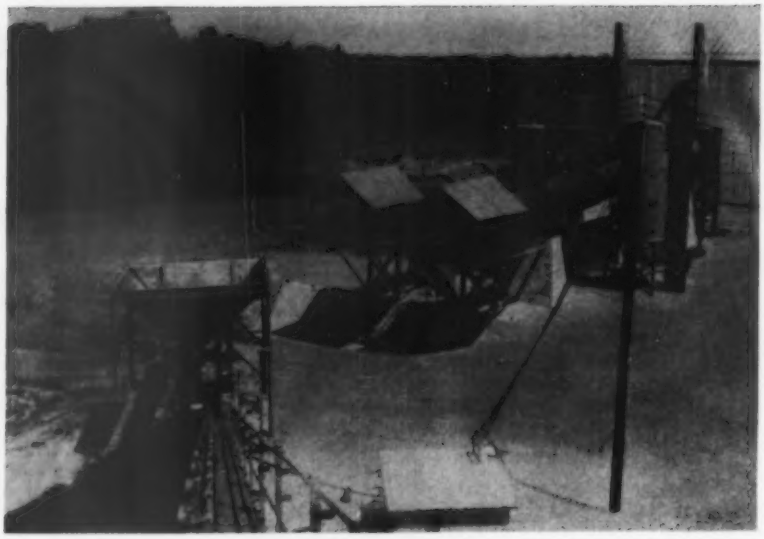
FACTORY-TRAINED DISTRIBUTORS EVERYWHERE



Florida Solite Corporation's new plant at Green Cove Springs, Fla.

Florida Solite Corp. Plant At Glen Cove Springs Running on 24-Hour Basis

Florida Solite Corporation's new plant at Green Cove Springs is now operating 24 hours a day, 7 days a week. This wholly-owned subsidiary of Southern Lightweight Aggregate Corporation operates Florida's first plant for producing Solite lightweight aggregate used in lightweight structural concrete and lightweight masonry units.

Florida Solite Corp. maintains headquarters in the Prudential Building, Jacksonville, Fla., with George W. Jones as District Sales Manager.

The two 135- by 8-ft. rotary kilns are used for firing the raw material at temperatures up to 2,300 deg. F. In the intense heat it expands, forming the millions of tiny air cells which give Solite its lightness, natural insulation, and sound absorbency.

Firing is followed by a natural cooling process. The resulting aggregate is a thoroughly annealed product that is chemically inert, fire resistant, and extremely light in weight.

Southern Lightweight Aggregate Corporation, parent company of Florida Solite, maintains offices in Richmond, Va.; Raleigh and Charlotte, N. C.; Columbia, S. C.; and Bethesda, Md. In addition to the new plant at Green Cove Springs, it also operates Solite plants at Aquadale, N. C.; and Leaksville Junction and Bremo Bluff, Va.

Our Cover Picture

● Modern advanced technology in the nonmetallic minerals industries is well exemplified by the processing installation illustrated on our front cover this month. A basic operating component of American Cyanamid's phosphate plant at Orange Park, Fla., this section is involved with flotation of coarse feed—and is described as one of only two that incorporate this method. The entire operation represents an answer to the challenge of increasingly difficult problems in recovery and processing of some Florida phosphate deposits. (See page 87.)

Canada Cement Company Marks 50th Anniversary—Cites Rising Production

This year Canada Cement Company Limited celebrates its 50th anniversary. The date of the company's founding was August 20. This concern is now producing 96,000,000 bags of cement annually, although its production during the depression year of 1933 had slipped to a low of 7,672,000 bags.

Since World War II, production has been increased every year except 1946, 1950, and 1954. In the last decade new plants have been built in Havelock, New Brunswick; Fort Whyte, Manitoba; and Woodstock, Ontario. Some of the company's 18 plants are manufacturing facilities; others are distribution and shipping plants.

Canada Cement began converting to wet grinding in 1928, developed sulphate-resisting cement for use in the prairie regions, and began producing a high-early-strength cement back in 1929. A major transition in the late '40's was that from rail to truck haulage. Latest experiments deal with reduction of fuel consumption per barrel of output—an experiment involving heat exchanger crosses.

Multimillion-Dollar Plant Planned for Ideal Subsidiary

Plans are in the advanced stage for a multimillion-dollar plant to be built in the foothills between Golden and Boulder, Colo., for the manufacture of Idealite lightweight aggregate. Great Western Aggregates Inc., a wholly owned subsidiary of Ideal Cement Company, will operate the facilities.

The new plant will have an annual capacity of 300,000 cu. yd. The crushing and screening department will have a capacity of 200 tons of shale per hour. Kiln measurements will be 12 ft. in diameter and 240 ft. in length.

The annual meeting of the Expanded Clay and Shale Association will be held January 28-29, 1960, at the Hotel Roanoke, Roanoke, Va. Virginia Lightweight Aggregate Corporation will be hosts.

Vulcan Materials Company Names Harold H. White Director, Blasting Practices

Vulcan Materials Company, one of the nation's top 350 businesses, has announced the appointment of Harold H. White as director of

Harold H. White

blasting practices and explosives research. Mr. White has a 30-year background of engineering experience in the planning and direction of blasting operations, development of special purpose explosives, and field-testing of explosives and detonators.

He has been chief engineer in mining and construction for companies in Pennsylvania and New York. Blasting operations under his direction include many major dam, canal and highway projects throughout the United States and Mexico, and he was one of the first to introduce modern blasting methods in Latin America.

General Crushed Stone Co. Acquires New York Concern

General Crushed Stone Company, Inc., of Easton, Pa., has purchased the assets of the Lima Crushed Stone Company, Lima, N. Y. John Rice Jr., vice-president of General Crushed Stone, stated that the purchase, plus the construction of a bituminous concrete plant at Lima in the near future, will involve a total investment of about $1 million.

General Crushed Stone operates plants and quarries in Pennsylvania, Delaware, and New York.

Pneumatractor Rotadrill is a complete, self-contained 125 cfm air compressor and self-powered drill rig that drives anywhere and sets up in minutes. It eliminates separate compressors and wagon drills. It's the most modern drilling method in existence. Available: gasoline or diesel.

NEWEST, MOST MODERN DRILLING METHODS:

Save up to ⅔ on drilling costs

Pneumatractor Rotadrill—combination rotary drill rig and 125 cfm air compressor—drills faster, cheaper, better . . . gives you lowest cost per ton. Compared with old-fashioned method of drilling with crawler-type wagon drills, Rotadrill saves up to ⅔ of the drilling costs. Why? Because Pneumatractor Rotadrill drills larger (4½") holes and faster holes to do the same job, better. Cost per ton is reduced, profit is increased. It's a sure money maker for any quarry.

Write for full information or see the Yellow Pages for local Sales, Service and Rental of Schramm Rotadrills — Truck, Pneumatractor, "Do-it-yourself."

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

640 North Garfield Ave. • West Chester, Pa.

COMPARE YOUR OWN DRILLING RATES with those of Crawler-type wagon drills and Schramm Pneumatractor with Rotatool, for bottom-hole drilling. The following figures are based on drilling records in Pennsylvania hard limestone.

Factors	Crawler-type Wagon Drill (with 600 cfm diesel compressor) 3" hole	Rotadrill with Rotatool (diesel) 4½" hole	Your Own Rates	How to Compute
Fuel and Oil	6 GPH .54 Oil .95 1.49	2.5 GPH .35 Oil .91 .36		Based on diesel fuel @ 14c per gallon.
Cost of Required Equipment	Drill 12,000 Compressor 16,000 $28,000	Rotadrill $10,000		Initial cost.
Depreciation and Maintenance	$28,000 / 10,000 = $2.8	$10,000 / 10,000 = $1.0		Average life expectancy (computed as 5 years @ 2000 hrs/year)
Labor	Driller $5 Helper 4 $9	$4.00		Average rate/hour plus fringe benefits. Rotadrill is one man operation.
Bit Cost	$52.25 x 51 / 300 = $8.95	$315 x 25 / 4000 = $1.97		List price of bit, times rate per hr., divided by total life expectancy (ft.)
Cost per Foot	$21.64 / 51 = $ .43	$8.23 / 25 = $ .33		Add fuel, depreciation, maintenance, labor, bit cost. Divide by average rate per hour.
Cost per Pattern	4 holes, 3" dia., 30' deep = 120' of hole @ .43 = $51.80	3 holes, 4½" dia., 30' deep = 90' of hole @ .33 = $29.70		Less holes are required for Rotadrill since hole size is larger.
Cost per Ton Removed	270 cubic yards or 337.5 tons = $ .15/ton	405 cubic yards or 506.25 tons = $ .06/ton		Cost per pattern divided by tons removed.

Enter 27 on card, page 155

9 years of field service prove safety and long life of Fatigue-resistant USS Tiger Brand Boom Support Assemblies

Nine years ago, American Steel & Wire Division introduced a *fatigue-resistant* Tiger Brand Wire Rope Boom Support Assembly. It was designed to combat the severe vibration on power shovels, draglines and cranes. Since then, it has been installed on thousands of machines with outstanding success.

Effectively dampens vibration. The spliced section gradually dampens vibration instead of concentrating it at one point. This results in greater safety and *much longer cable life.*

Visibility increases safety. With this construction, inspection is easy and the development of broken wires is readily detected. They are not hidden in a shank or socket basket. Thus, you can tell when to replace the assembly in time to prevent accidents.

Easy application. There's no need for extensive alteration of your present equipment. Tiger Brand Wire Rope Boom Support Assemblies are made with standard-size fittings. These are completely interchangeable on standard equipment. For further information, contact our nearest office or write American Steel & Wire, Dept. 9223, 614 Superior Ave., N. W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

Greater safety—20% longer service life was obtained from these Tiger Brand Boom Support Assemblies used on a crane owned by the Hunkin & Conkey Construction Co. in Ohio.

Vibration is effectively dampened by these Tiger Brand Boom Pendants with spliced ends. The splice can be readily inspected for broken wires—an added safety factor.

American Steel & Wire Division of United States Steel

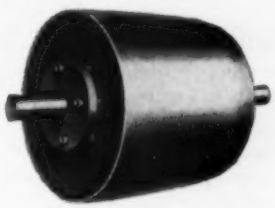
Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad

STEPHENS-ADAMSON

BELT CONVEYOR SYSTEMS LOWER STONE & AGGREGATE HANDLING COSTS

A river of stone and aggregate is carried daily over the innumerable sand, gravel and rock handling and processing installations designed and built over the years by STEPHENS-ADAMSON engineers. Every operator's handling problem receives individual consideration and over 58 years of STEPHENS-ADAMSON engineering "know-how" provides a valuable source of ideas for meeting and solving the problems of each new installation. The final result is always the same . . . bulk materials are handled at the lowest cost per ton. Backing up the "know-how" and experience is a quality engineered line of components, each providing an exclusive combination of features—many of them carrying patents by S-A engineers. Put STEPHENS-ADAMSON engineering experience and manufacturing skill to work for you —write for full information today!

Stone rides uphill on a 19 degree slope from a gyratory crusher. The 36 inch wide belt, pictured, carries 650 tons per hour along a 439 foot run.



S-A CURVE-CROWN PULLEYS
—Maximum belt training effect with minimum belt stretch and wear are provided with exclusive S-A CURVE-CROWN design.

WRITE FOR BULLETINS 355 and 558

S-A
MATERIALS HANDLING PRODUCTS
SEALMASTER BALL BEARING UNITS

ENGINEERING DIVISION
STEPHENS-ADAMSON MFG. CO.
GENERAL OFFICE & MAIN PLANT, 20 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO

Enter 29 on card, page 155

← Enter 28 on card, page 155

RECOGNIZE THIS LOT?

It's the lot of a Caterpillar Dealer, one of over 300 in the U. S., offering you the best buys in used equipment!

No matter what you want in used equipment, no matter what the price range, your Caterpillar Dealer is headquarters for your best buy. No other dealer offers you "buys" with this protection:

1 **A "BONDED BUY"** up to $10,000 on used Cat-built equipment—your guaranteed assurance of satisfactory performance on *all* parts of the machine during the guarantee period.

2 **A "CERTIFIED BUY"**—his written guarantee covering units of any make.

3 **A "BUY AND TRY"** deal—his written money-back agreement on units of any make.

For the best buys in your area, to be *sure* of what you're buying, see your Caterpillar Dealer. You'll find him listed in the Yellow Pages!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

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BEST BUYS IN NEW AND USED EQUIPMENT

Enter 30 on card, page 155

Medusa Portland Cement Plans $70,000,000 Expansion For 30% Capacity Increase

A 10-year program of expansion and modernization, costing about $70 million, will be initiated soon by Medusa Portland Cement Company. A capacity boost is envisioned, from the present annual 12,000,000 bbl. to 16,000,000 bbl., an increase of 33 percent.

Modernization is planned (over the next two years) for the plants at York, Pa., and Toledo, Ohio. This project follows a similar program which lifted rated production from 8,000,000 bbl. to the current output.

533,000,000-Ton Production Of Crushed Stone in 1958

Crushed and broken stone production in 1958 exceeded the record established in 1957 by nearly 2 million tons, despite reduced activity in several fields of use. Total output in 1958 as reported to the U. S. Bureau of Mines, reached a new high of 533,000,000 short tons, valued at $746,000,000. The increased demand for concrete and roadstone under the Federal Highway Program offset reduced sales for industrial applications.

As in previous years, production included crushed stone used for concrete aggregate, roadstone, cement, lime, metallurgical flux, railroad ballast, refractory stone, agricultural limestone, abrasives, and riprap, and in various chemical and other manufacturing processes. Asphaltic stone is excluded from the total, but a small quantity of crushed and broken slate is included for the first time. Both 1957 and 1958 United States totals include Alaska and Hawaii, but areas administered by the United States are given separately.

Over one-half the crushed and broken stone went into concrete and roadstone applications in 1958. Nearly 90 percent of the aggregates produced for these purposes came from commercial operations. The accelerated Federal Highway Program and a number of dam and airfield construction projects supported crushed stone sales in 1958. Consequently, output of stone for concrete and roadstone rose to 322,000,000 tons. This was an increase of more than 24,000,000 tons over 1957.

Portland and natural cement production consumed 15 percent of the year's crushed and broken stone—an increase of 3 percent in tonnage compared with 1957—and agriculture took 4 percent of the total—an increase of 4 percent in tonnage. Quantities for riprap and fill also increased, but volume for other major uses declined.

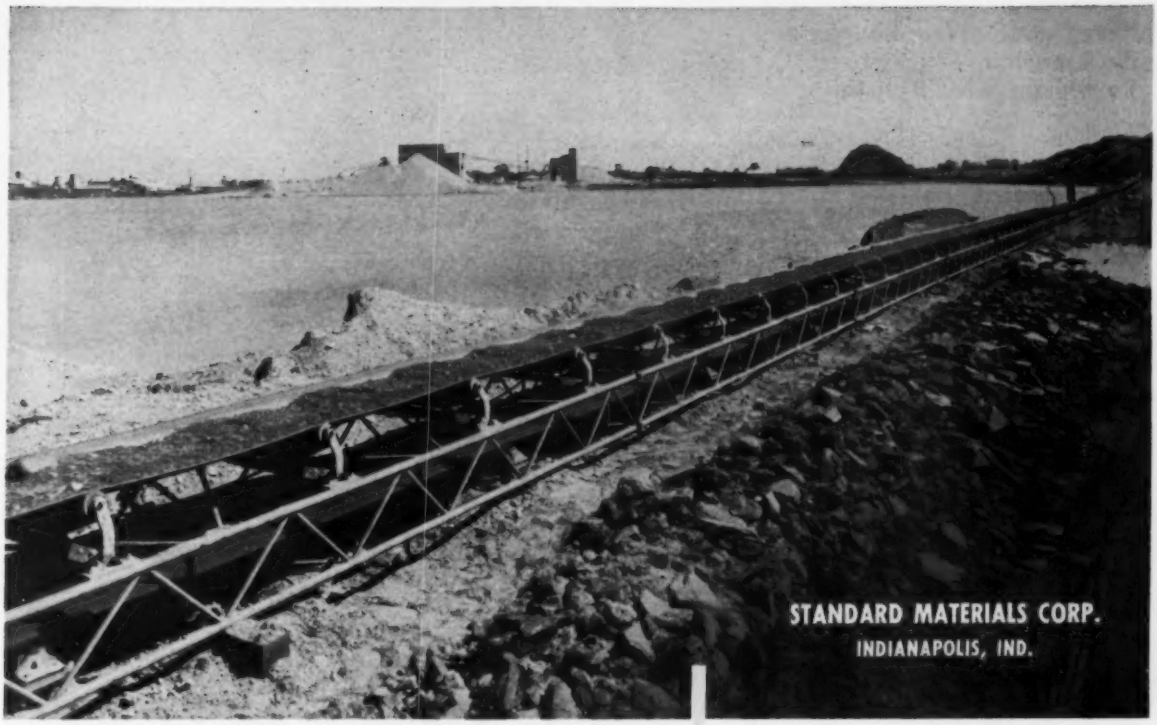
Limestone and dolomite accounted for 73 percent of the total crushed stone in 1958, which were quarried in 46 states. Furnace flux amounted to 7 percent of the total limestone produced in 1958. However, reduced steel output resulted in a decrease of 35 percent in limestone consumption for this purpose compared with 1957.

Silos Under Construction For Texas Industries Plant

A contract for design and construction of three sets of silos for the new 4,000-bbl.-per-day wet-process cement plant now going up at Midlothian, Tex., for Texas Industries, Inc., of Dallas, was awarded to Macdonald Engineering Co., Chicago. (See PIT AND QUARRY, September, 1959, p. 26.) Construction began on the silos in September, and completion is scheduled within eight months.

Two clinker silos, 32 ft. in diameter, and two silos for gypsum and sand, 23 ft. in diameter, are to be built together, all with a height of 66 ft. Eight finished-cement storage silos are to be 30 ft. in diameter and 106 ft. in height, and will hold 110,000 bbl. The contract also includes six slurry tanks, 30 ft. in diameter and 50 ft. high, which are to be constructed with a slip-formed concrete core wall which will be prestressed by wire winding, and later Gunited.

Efforts are underway to develop export markets for 200,000 tons of cement a year from India. Cement production in that country rose last year by 460,000 tons to 6,060,000 tons. Two new mills started production during the year, bringing the number of plants to 31.



Standard Materials Corporation's new Indianapolis plant uses MARCO field conveyors exclusively. The 30" conveyor system transports 400 to 450 tph of sand and gravel around lake to plant site.

Conveyor units range in length from 500 to 800 ft.

A foot or a mile...

MARCO® field conveyors are your best buy

MARCO field conveyors are designed so they may be quickly assembled and later shortened, lengthened or rearranged — all without cutting or welding.

The greater rigidity of MARCO's *tubular frame* construction eliminates the expense of conveyor supports or foundations. These stronger frames resist misalignment and increase belt life.

Production is increased because MARCO field conveyors provide a continuous feed to plant machinery, — yet your investment and operating costs are lower. There are no haul trucks to buy or operate . . . no haul roads to build or maintain.

Specify MARCO on your next installation — large or small. The proven economies of MARCO field conveyors will increase your profits.

For more information consult your MARCO Distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

EXCLUSIVE CONVEYOR FEATURES OFFER MAXIMUM PROTECTION AGAINST BELT-EDGE DAMAGE

WIDER FRAME

MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area — between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.

WIDER FACE PULLEYS

MARCO is first with modern pulley specifications. 2" between belt and pulley edge — provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.

MARCO's built-in belt protection is all the more important in field conveyor installations — since a minimum amount of time can be devoted to belt alignment.

MARCO®

engineered MARCO products:

Tubular Frame Belt Conveyors · Conveyor Idlers · Solid and Self Cleaning Steel Pulleys
Bucket Elevators · Control Gates · Feeders · Bins

Perry Jones Firm Bought By American-Marietta To Merge with Division

All quarries and stone-crushing facilities of Perry Jones, Carbondale, Kans., have been purchased by American-Marietta Company.

Fred E. Bellamy, president of Concrete Materials and Construction Division, American-Marietta Company, of Cedar Rapids, Iowa, announced that the firm will be combined with this Division and the name changed accordingly. He said present personnel of the Perry Jones firm will be retained and the company contemplates no immediate changes in the operation.

The Perry Jones firm originated in 1946 and presently consists of approximately 40 quarry locations, 27 of which maintain stockpiles of materials to serve customers in their respective areas. Stone-crushing facilities consist of three portable crushing plants employing approximately 60 men.

Concrete Protection for Crew Of Nuclear-Powered Ship

The prototype nuclear-powered ship *Savannah* will have a concrete shield made from Alpha Portland Cement Company cement and an aggregate of coarse iron ore surrounding its atomic power plant. Cement from Alpha's Martins Creek, Pa., plant will be used to make the heavy encasement which will protect the surface ship's crew from possible harmful effects of radiation.

Concrete work is being handled by the Intrusion Prepakt Company.

The *Savannah,* christened July 21, is the world's first nuclear-powered commercial ship.

$500,000 Barite, Gravel Mill Scheduled for Arkansas

Plans have been announced for the building of a $500,000 barite and gravel mill in Dierks, Ark., for the U. S. Glass and Chemical Company. Construction is set to begin soon, and operations are scheduled to start within several months.

Initial annual capacity will be 35,000 tons of barite and 250,000 tons of commercial grade gravel.

● At the 250-acre quarry operated by Stuart M. Perry, Inc., in Winchester, Va., stripping is handled with a new Marion Type 43-M backhoe. The 1-cu. yd. air-controlled machine first removes 4-8 ft. of overburden, then excavates the remaining soil from pockets formed by jagged outcroppings. The soil is sold for dirt fill, or used on company haul roads.

Engineering Ads Publicized By Engineers Joint Council

"Scientists make it known, but engineers make it work!" This is the theme of a series of public service ads published by Engineers Joint Council now appearing in *Editor & Publisher,* a business magazine for the newspaper profession. The ads are designed to create desirable understanding of engineers and engineering by printed media, radio and television, public officials, organizations, and advertising agencies.

One of a series

Let's get clear on—
WHAT ENGINEERS DO

Simply stated, engineers apply the sciences to give people use of nature's materials, forces.

Scientists make it known. Engineers make it useful.

Scientists split the atom; engineers design and build the atomic power plants.

All science known would benefit nobody if not applied by engineers to manufacturing, construction, mining, agriculture or the generation of power.

These are the great engineered industries—all based on scientific knowledge.

Engineers plan, design, produce, maintain and operate. To repeat: *Scientists make it known. Engineers make it useful.*

Engineers Joint Council
29 West 39th St., N. Y. 18, N. Y.
For information call Pennsylvania 6-9220

These ads—which carry such titles as "Let's Get Clear On What Engineers Do," "Engineer Shortage?—Who Says?" and "Say Engineer When You Mean Engineer!"—may help news writers and editors present to the public a better picture of the engineer and what he does. They also will help to clear up the confusion between "scientists" and "engineers," terms frequently used interchangeably but wrongly so.

According to Enoch R. Needles, president of the Engineers Joint Council, which represents 350,000 of the nation's engineers, "The engineer's hand touches every material thing used by the consumer to make his life a happier one. Our expanding economy is an engineered economy, and it is high time people realized their obligation to recognize the men and women who are making it possible."

Engineers Joint Council, in each of the ads, offers itself as a source of information and reference on the broad aspects of the engineer's responsibility, his education, and his work. It prepares timely and accurate reports on such matters as engineers salaries, the number of engineering graduates, the number needed, and opportunities for engineering teachers.

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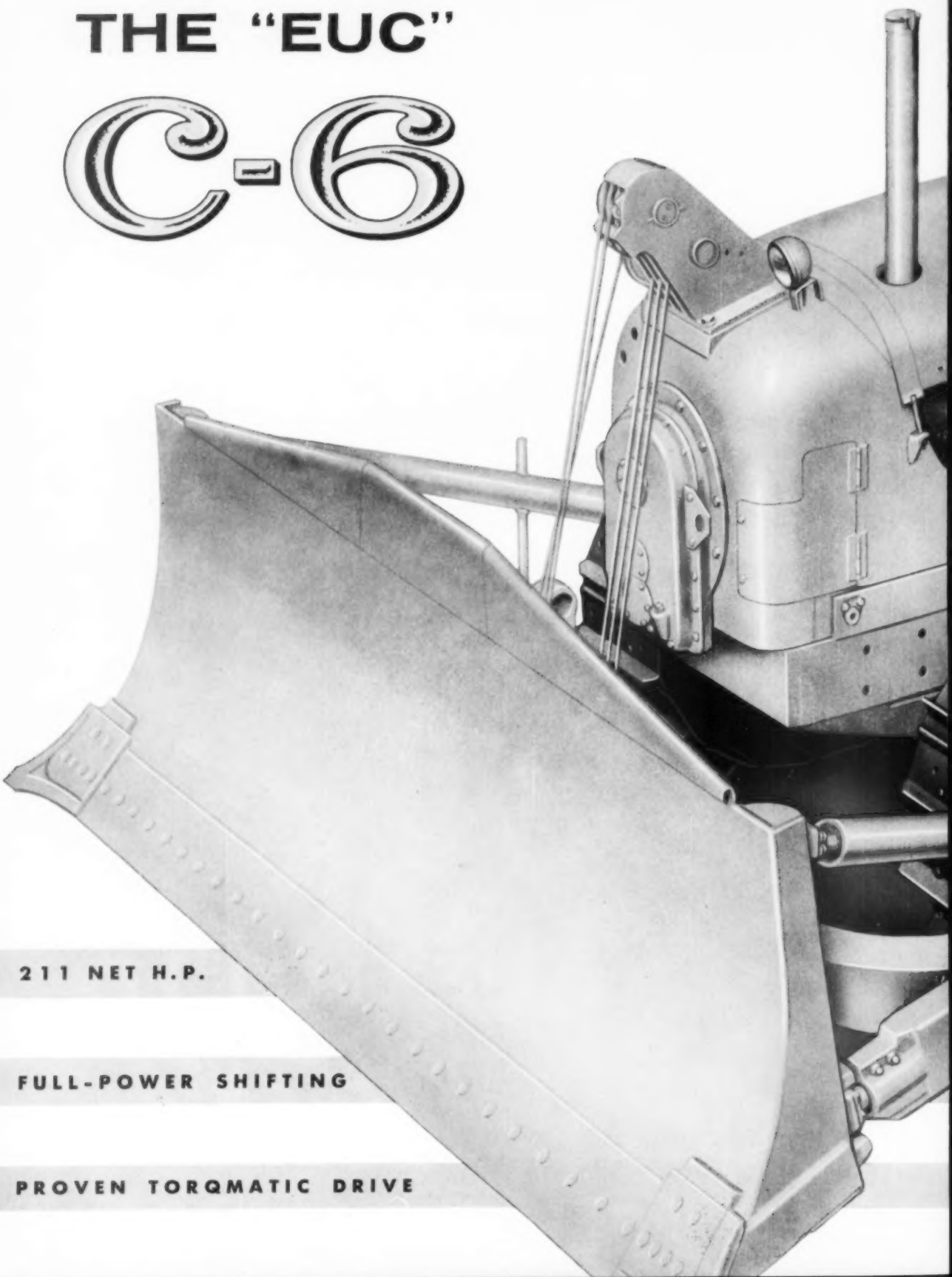
EUCLID

PRESENTS...

THE "EUC"

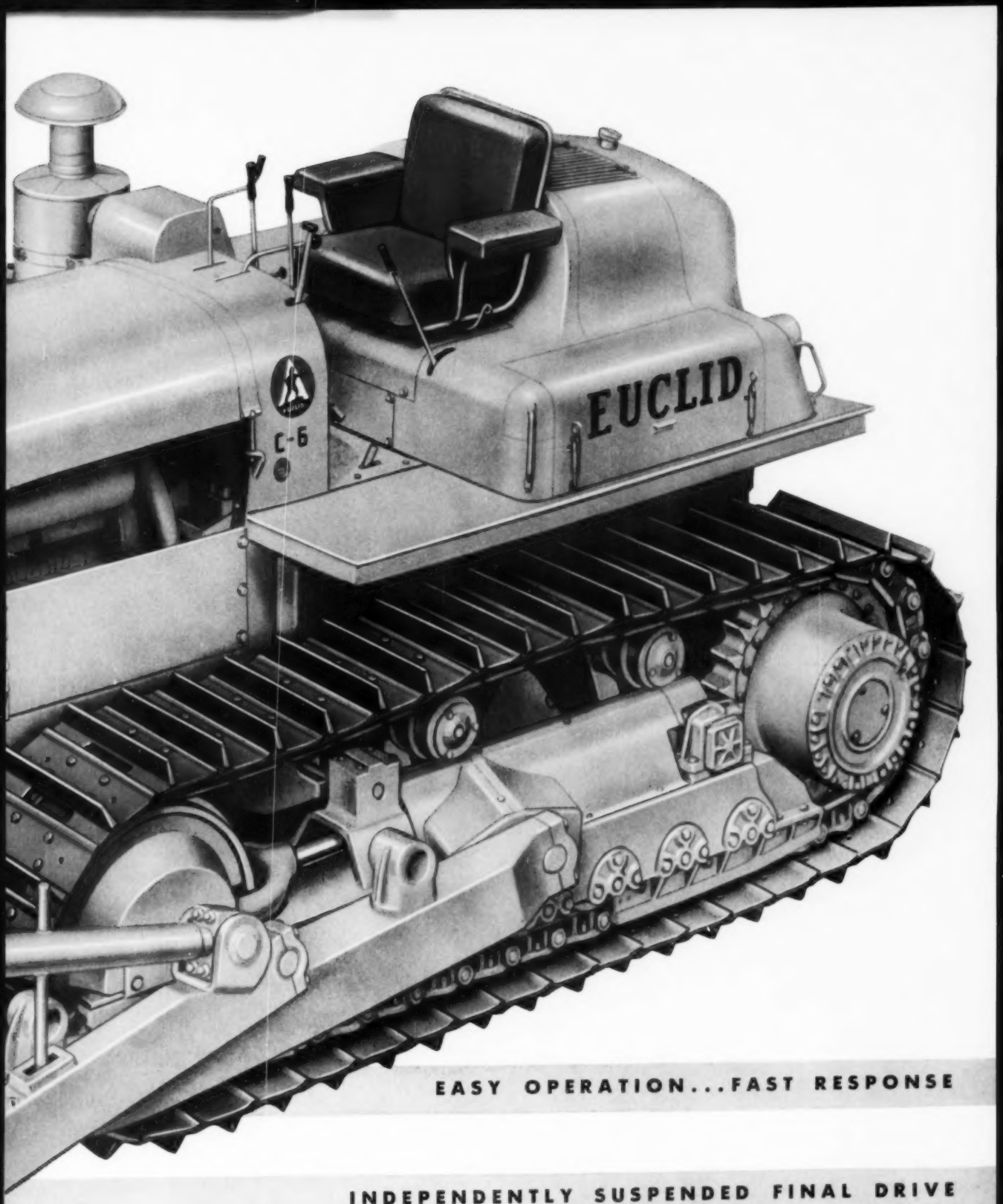
C-6



211 NET H.P.

FULL-POWER SHIFTING

PROVEN TORQMATIC DRIVE



EASY OPERATION...FAST RESPONSE

INDEPENDENTLY SUSPENDED FINAL DRIVE

OUTSTANDING ACCESSIBILITY...EXCELLENT MANEUVERABILITY

5 YEARS UNDER TEST...

the "EUC" C-6 provides New Crawler Standards

Proved by over 5 years of rugged field test . . . in mines, quarries, heavy earthmoving and logging as well as on the proving grounds. With 211 net hp. and proven Torqmatic Drive, the C-6 features full power shifting and time-saving maneuverability . . . has plenty of power and speed for dozing, ripping, pushloading scrapers and all other big tractor work.

Operators report that excellent visibility and over-all ease of handling give the C-6 smooth performance that gets more work done every shift . . . and with less downtime for service and maintenance.

EASY SERVICING

Maintenance designed—the C-6 has exceptional accessibility and all major components are "out in the open"—easy to get to. For example, the engine is easily serviced or removed, and the converter, transmission, steering brakes and clutches assembly can be removed as a complete "package" without major disassembly . . . final planetary drives can be serviced without removing sprockets or breaking track . . . there are considerably fewer lube points than in competitive tractors.

Have your Euclid Dealer give you the performance facts that prove the C-6 assures a better return on investment

GM GENERAL MOTORS EUCLID

EUCLID DIVISION OF GENERAL MOTORS

Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

. . . a complete line of equipment for heavy earthmoving, mining, logging and many industrial operations . . .

Printed in U.S.A.

Permanente Lets Contracts For Primary Facilities Of $13,500,000 Oahu Plant

Permanente Cement Company has awarded a contract for construction of initial facilities at its $13,500,000 Hawaiian cement plant to Anderson-Westfall Company of Portland, Oreg.

The Portland general contracting firm submitted a low bid of $662,809 for the construction of eight cement storage silos and a sacking plant. Work under this contract will proceed immediately.

Permanente also announced that fabrication of the shell of the 453-ft.-long rotating kiln for the Hawaiian facility is well under way at the Napa, Calif., plant of Kaiser Steel Corporation's Fabricating Division. Kaiser Steel holds a subcontract for fabrication of the kiln shell and grinding mills from F. L. Smidth & Co., engineers and manufacturers of New York. The giant kiln will be shipped to Honolulu in 15 sections.

Contracts for erection of the kiln and other construction phases will be let through Henry J. Kaiser Construction Company as the project develops.

Permanente's new plant, located on the island of Oahu, at Lualualei Naval Road and Paakea Road near Nanakuli, will have an annual productive capacity of 1,700,000 bbl. of cement. It will utilize a land-based coral deposit nearby as the principal source of raw material.

Newfoundland & Minerals Open for Business—as Usual

Mining operations are expected to continue uninterrupted at the Newfoundland and Minerals Ltd. plant near St. John's, New Brunswick, despite the damage caused by a fire recently. Although installations worth $100,000 were destroyed in the blaze, the plant was fully covered by insurance.

Management has installed a talc crushing plant in its quarry, and also has new facilities under construction at its pier nearby. Talc will now be exported in crushed form, rather than as powder.

Newfoundland Minerals is owned by the American Encaustic Tiling Company of Lansdale, Pa.

● National Gypsum Company's new multimillion-dollar lake-front gypsum products plant at Waukegan, Ill., was dedicated and opened to visitors recently during a four-day celebration. About 4,000 persons inspected the buildings, which constitute the first Gypsum plant in Illinois. (The bottle-like structure on the left houses a part of the Thermo Flo sytsem for calcining gypsum, which is then made into plaster and wallboard.

Production was actually begun last May in the wallboard section. Gypsum ore is shipped by rail and water from the firm's open-pit mine near Tawas City, Mich. Operations—from the ship unloading docks to the loading of finished products—are fully automatic.

The Waukegan facility is a part of National Gypsum's $25,000,000 Great Lakes gypsum mining and processing network. A similar installation is to be completed by next spring in Lorain, Ohio.

Ware Named Chief Executive At International Min. & Chem.

Thomas M. Ware, president of International Minerals and Chemical Corporation, Chicago, Ill., has been made chief executive officer of the corporation by its board of directors. Louis Ware will continue as chairman of the board.

Thomas M. Ware, chief executive officer, International Minerals & Chemical Corp.

Mr. Ware has been with International Minerals and Chemical Corporation for 12 years and was chief engineer, vice-president of engineering, and administrative vice-president before being named president in May, 1958.

A new $100,000 sand and gravel wash plant was recently put into operation in an expansion program at McGrady, Incorporated, Harmar Heights, Pa. McGrady supplies sand and gravel to steel mills and foundries.

The United States Borax Chemical Corporation, a Nevada firm, plans to open a borax mine in Harney County, Oregon, on 2,560 acres leased from the state.

7 TONS PER PASS . . . . . .

big PAYLOADER® steps up output on loading and stockpiling

This new Model H-120 "PAYLOADER" tractor-shovel is setting production records in pits, plants and quarries throughout the country. Owners report handling up to 7 tons per pass. This big capacity, coupled with exceptionally fast cycle speeds, steps up plant output tremendously, cuts truck loading time and costs, and greatly improves plant efficiency.

Loads More Trucks Per Hour

Reducing the waiting and loading time of trucks, both your own and those of customers, not only improves service but also makes it possible to handle a greater volume. Extra-high lift (14'7½" under hinge pin, 10'10" dumped clearance) and longer reach (3'6" from tires) load biggest trucks with ease and safety.

More Output Per Dollar

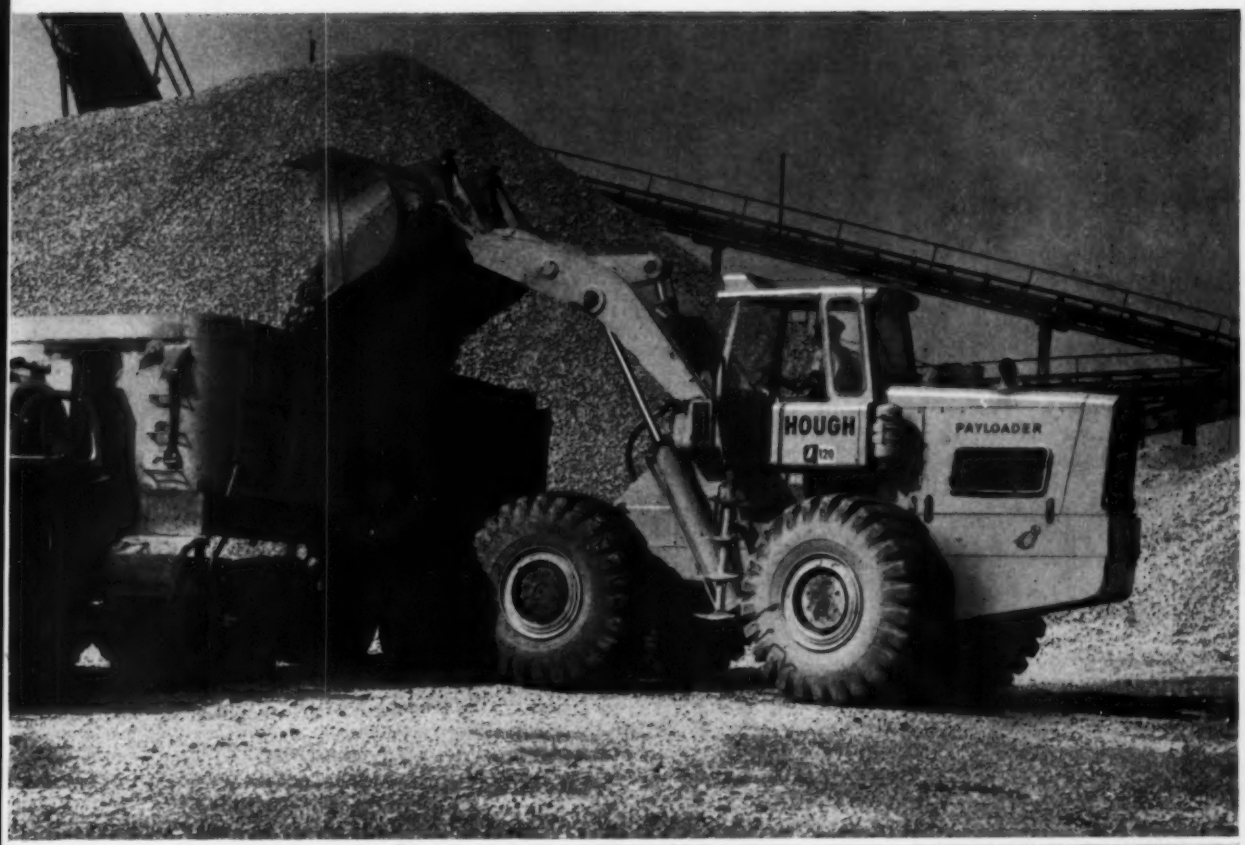
In many instances, a single H-120 has replaced several smaller tractor-shovels or clamshell cranes, with greater output, lower equipment investment and less labor cost.

Mobility and Flexibility

Travel speeds up to 26 mph make the big capacity of this unit available anywhere in the area in a matter of seconds. It can load from various stockpiles or move rapidly to other areas to build new stockpiles . . . to clean-up, strip, excavate or load in the pit.

Greater Safety

The operator is seated high enough to permit him to see the bucket at all times and with full visibility in all directions. Boom arms and moving parts are located well forward and removed from any contact with the operator. Safety ladder and safety-glass front and rear windshields are additional operator protective features.



. . . LOADS TRUCKS FASTER

Riding and Operating Ease

A long wheelbase, wide tread, big 26.5 x 25 tires, good stability and low center of gravity, together with adjustable bucket-type seat give the operator a comfortable ride. Full power control — power-shift transmission, power-steer and 4-wheel *air-brakes* — makes this "PAYLOADER" easier to operate than many smaller tractor-shovels. Controls are easy to reach and simple to operate.

Advanced Design

More than a ton of "dead-weight" on the working end of the H-120 is saved by fabricating the boom arms of expensive "T-1" steel which has a yield strength three times that of structural steel. Approved use of dry ballast in the rear tires further eliminates "dead-weight" while providing better stability and a lower center of gravity.

More Power

A heavy-duty, turbo-charged, 300-horsepower diesel engine delivers abundant power for handling both tractive and hydraulic functions simultaneously without "lugging down".

For additional information on the new H-120 "PAYLOADER" use the attached coupon or contact your HOUGH distributor.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

THE FRANK G. HOUGH CO.
750 Sunnyside Ave., Libertyville, Ill.
Send complete Model H-120 "PAYLOADER" data

Name _____
Title _____
Company _____
Street _____
City _____ State _____

10-8-3

$23,000,000 Expansion Plan To Increase Ideal Output By 2,750,000 Bbl. Annually

The board of directors of Ideal Cement Company have approved a $23,000,000 expansion program which will add 2,750,000 bbl. to the firm's annual cement capacity.

A second kiln will be installed at the firm's Tijeras, N. M., plant, increasing the capacity of the plant from 1,250,000 to 2,500,000 bbl. annually. Cost will be about $7 million, with completion scheduled for the end of 1960.

Authorization was given for a 1,500,000-bbl. cement plant at Clarkston, Wash., which will cost an estimated $14 million. Negotiations for the plant site are under way. Options have been obtained on a limestone quarry 39 miles upstream from Clarkston on the Washington side of the Snake River, and on a 160-acre limestone deposit on Mill Creek, near Culdesac. Several major items of equipment have already been purchased. Construction will begin in 1960, with production slated for the end of 1961.

New storage and packing facilities will be constructed at the Superior, Nebr., plant at a cost of about $2 million.

Capacity of Inland Cement Scheduled for Expansion

Inland Cement Company Limited management plans to increase productive capacity of both its Edmonton and Regina, Sask., plants.

In Edmonton a new kiln with a nominal capacity of 1,000,000 bbl. annually will be installed. The Regina plant is to be equipped with an improved dust-collection system and the addition of a raw-grinding mill.

Calaveras Bulk Loading Setup In Operation at San Andreas

New bulk cement facilities have been placed in operation at the Calaveras Cement Company plant at San Andreas, Calif. The new system, in conjunction with existing loading facilities, will permit the simultaneous loading of three bulk cement trucks, two sack cement trucks, and a railroad car.

● Consolidated Rock Products Company, largest sand and gravel producer in the west, has added two new Yale Trojan 404 tractor shovels to its giant fleet of bulk material handling equipment. The diesel powered Trojans will be used to load trucks from stock piles, and will serve in emergencies when a pit shovel breaks down in any one of the firm's nine operations, according to Walter L. Good, operations manager. A 4½-cu. yd. capacity bucket permits loading a truck and trailer in just four passes, or a 25-ton capacity truck in just 1½ minutes.

Two steel bulk-loading tanks, 25 ft. in diameter, each having a capacity of 2,700 bbl., are mounted above a 10- by 60-ft. long Fairbanks-Morse truck scale, permitting cement to be rapidly discharged by gravity to a bulk truck on the scale.

Cement is pumped from storage silos 350 ft. away into the bulk-loading bins by a 10-in. Fuller-Kinyon cement pump which keeps the bins constantly replenished.

Design work for the new project was directed by J. C. Powell, Calaveras plant engineer. The tanks were designed, fabricated, and erected by the Chicago Bridge & Iron Company.

Australian Cement Industry Booms in Post-War Years

Post-war growth of the Australian cement industry has boosted production from a 868,000-ton output in 1938 to an output of 2,300,000 tons during 1957. Figures for the first eight months of 1958 indicated a further increase.

Peak imports of 350,000 tons during 1951 dwindled progressively, being limited in 1958 virtually to white and colored cement. According to estimates of the Australian Department of Trade, nearly £12,000,000 was spent in plant additions and replacements during the period of 1950-1957.

Minahan Stone and Gravel Opens Plant near Boswell, Pa.

Minahan Stone & Gravel went into operation recently in southwestern Pennsylvania, near Boswell. Robert E. Minahan is owner of the firm, which, with its crushing plant and related quarry equipment, represents an investment of $160,000. The company has leased a 125-acre tract of land from Eldora Land Corporation of Johnstown, Pa.

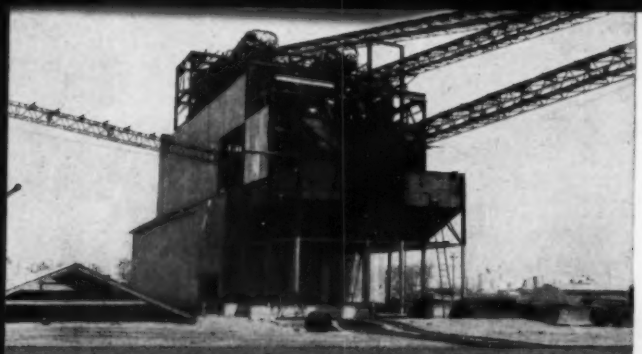
Tests conducted by geologists at the deposit indicated that it contains 50,000,000 tons of stone which, according to the Pittsburgh Testing Laboratories, has a high-grade silica content.

Products will include sand of various kinds, gravel, and anti-skid, the latter an abrasive gravel for application to pavements in winter.

Penn-Dixie Plant Quarry Re-Awarded Safety Trophy

Employees of the Penn-Dixie Cement Corporation plant No. 1 quarry at Speers Ferry, Va., were recently re-awarded the Portland Cement Association safety trophy for having operated throughout 1958 without lost-time, permanently disabling or fatal injury.

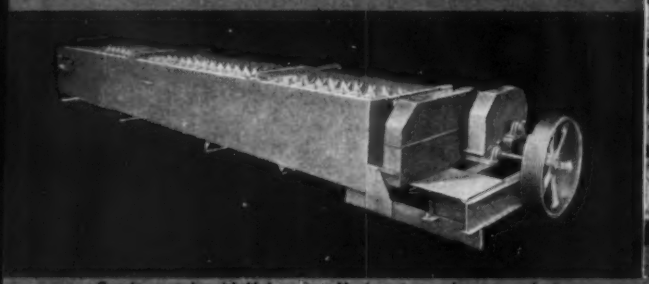
At present, plant No. 1 has a safety record of over 1,125 days or 1,299,631 manhours without a lost-time accident. Plant No. 1 quarry has operated 2,197 days without a disabling injury.



In Standard Materials Corporation's Maywood (Indianapolis) plant, two 10' x 30' McLanahan Log Washers.

In the Plainfield, Indiana plant, a 10' x 25' Log Washer.

In the Clinton, Indiana plant, a 10' x 25' Log Washer.



Fundamentals with McLanahan Mudmasters—cleaner product, profitable tonnages, up to 40% lower power requirements, compared with other types of washers.

Selected by
STANDARD MATERIALS
not once but
10 times

This progressive Indiana and Kentucky operator selected ten McLanahan Mudmaster Log Washers for installation in seven gravel plants during a two year period.

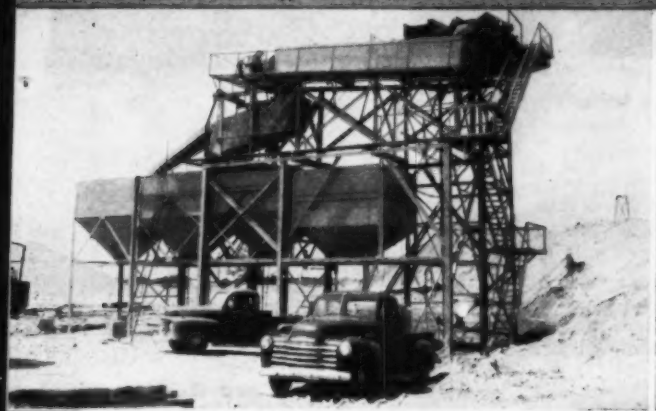
McLANAHAN SINCE 1835

LOG WASHERS

McLANAHAN AND STONE CORPORATION
HOLLIDAYSBURG, PENNSYLVANIA

In the Milton, Kentucky plant, a 10'x30' McLanahan Log Washer.

In the Burlington, Kentucky plant, a 10'x25' McLanahan Log Washer.



In Standard Materials' 86th Street (Indianapolis) plant, a 10' x 25' McLanahan Log Washer.

Now under construction, at the Speedway (Indianapolis) plant—one 10'x30' and two 10'x25' Logs.

Pellets formed in revolving pan are fed to traveling grate for drying and pre-calcining.

Plan to stay ahead... MODERNIZE!

Pellets to profits

"COORDINEERED" Allis-Chalmers Equipment Paves Way to Increased Capacity at Diamond Portland Cement Co.

Progressive — that's Diamond Cement at Middle Branch, Ohio. Modernization — $5,000,000 worth — has meant an additional million barrels of *low-cost* production for this relatively small, but aggressively on-the-grow operation.

Significantly, Allis-Chalmers supplied much of the major equipment in this modernized plant. Wheel horse in the operation is a complete *ACL* kiln system — pelletizer to clinker cooler. Other Allis-Chalmers equipment includes two vibrating screens and a pair of 1000-hp ball mills. Associated electrical equipment was also supplied by Allis-Chalmers.

"Heads-Together" Approach to Application

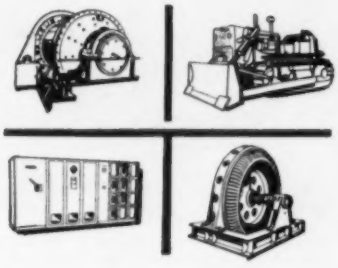
Allis-Chalmers manufactures a most diversified line of processing and electrical equipment. Each product department is staffed with research, design, manufacturing and application specialists. "Coordineering" results from an interdepartment exchange of ideas and the correlation of specific skills. Integration of thinking, planning and engineering precedes integration of equipment.

Help for You or Your Consultants

Arrange a meeting with your A-C cement team. See your local representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

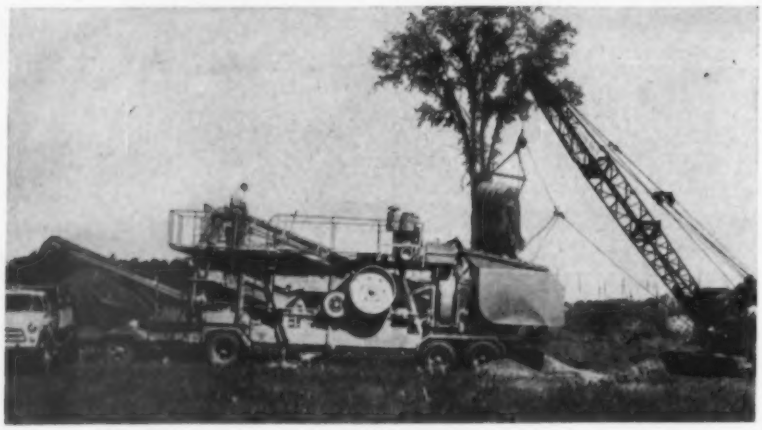
Allis-Chalmers Products for Cement Industry

Earth-Moving Equipment
Kilns Grinding Mills Crushers
Vibrating Screens
Dryer-Coolers Motors Control
Switchgear
Unit Substation Steam Turbines



ALLIS-CHALMERS A-C A-5928-CM

ACL is an Allis-Chalmers trademark.



● Richard Cousineau Company, Big Rapids, Mich., uses this Diamond Iron Works Type 66 portable crushing plant to process gravel for road jobs. The truck on which the unit is mounted was specially designed by Cousineau for transporting the crushing plant from job to job. The truck's drive compartment, covered by a tarpaulin, can be seen at the left.

$1,500,000 Kaolin, Silica Plant Built by J. R. Simplot Company

Construction began recently on a $1,500,000 clay and silica beneficiation plant near Bovill, Idaho, for the J. R. Simplot Company of Pocatello, Idaho. The facilities will be called the Miclasil Operations of the Simplot Minerals and Chemical Division—the name being derived from the mica-clay-silica products.

The plant's first product, slated to be in production during October, will be white glass sand, according to Philip T. Peterson, plant manager. By the first of the year the plant will add quality clays (snow white, finely powdered kaolin product) for paper filler and high gloss paper surfacing. Scrap, or small-particle, mica is the projected third product.

June Domestic Sales of Lime Show Increase over May

Domestic sales of open-market lime in June (992,769 short tons) increased from the previous month's total, according to reports released by producers to the U. S. Bureau of Mines.

Construction, and chemical and other industrial lime increased, whereas a decrease was noted in agricultural and refractory lime.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1958-59, by Types and Major Uses, in Short Tons.

	May 1959	June 1959	June 1958	January-June 1959	January-June 1958
By types:					
Quicklime	[2]714,730	784,243	462,919	[2]3,990,604	2,703,574
Hydrated lime	[2]180,692	208,526	161,474	[2]1,021,327	907,375
Total	[2]895,422	992,769	624,393	[2]5,011,931	3,610,949
By uses:					
Agricultural:					
Quicklime	8,789	4,656	4,497	37,850	24,330
Hydrated lime	14,904	7,554	10,441	69,347	73,159
Total	23,693	12,210	14,938	107,197	97,489
Construction:					
Quicklime	[2]13,243	10,344	11,804	[2]72,693	62,889
Hydrated lime	[2]89,595	103,654	80,244	[2]473,553	432,043
Total	[2]102,838	113,998	92,048	[2]546,246	494,932
Chemical and other industrial:					
Quicklime	[2]466,948	544,937	311,690	[2]2,599,105	1,893,574
Hydrated lime	[2]76,193	97,318	70,789	[2]478,427	402,173
Total	[2]543,141	642,255	382,479	[2]3,077,533	2,295,747
Refractory (dead-burned dolomite)	[2]225,750	224,306	134,928	[2]1,280,955	722,781

[1]Also includes a quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.
[2]Revised figure.

300 T.P.D. Silica Sand Plant Scheduled in Washington

The Lane Mountain Silica Company has been formed in Stevens county, Wash., by Northwestern Glass Company of Seattle, and Smith Brothers Silica Sand Company of Auburn, and several individual stockholders. The new firm has leased 1,000 acres on Lane Mountain containing deposits estimated capable of producing at least 100,000 tons of high-grade silica sand per year for more than 100 years.

Sand ore will be crushed at the quarry and then trucked to the proposed mill in Valley, Wash.

DON'T TAKE A CHANCE—

TAKE YOUR POLIO SHOTS!

Millions of Americans are still not polio-protected as the 1959 polio season quickly approaches. *Polio isn't licked yet!*

Among those not vaccinated, paralytic polio cases actually *increased* in 1958 over 1957. (There were more children's cases, too.) Play safe . . . make sure you and your family get *all* your polio shots . . . before it's too late. Remember polio strikes all ages.

SEE YOUR DOCTOR OR HEALTH DEPARTMENT NOW

Published as a public service in cooperation with The Advertising Council and the Newspaper Advertising Executives Association.

Grinding mills grow... operating costs shrink

2000-hp mill does work of multiple units – at far less cost

It's the big mill that grinds out profits. Want proof? In a typical installation, a giant 13 by 20-ft, 2000-hp Allis-Chalmers mill replaced two 10½ by 17 units. Operating costs were cut by a whopping 25% without losing one ounce of capacity.

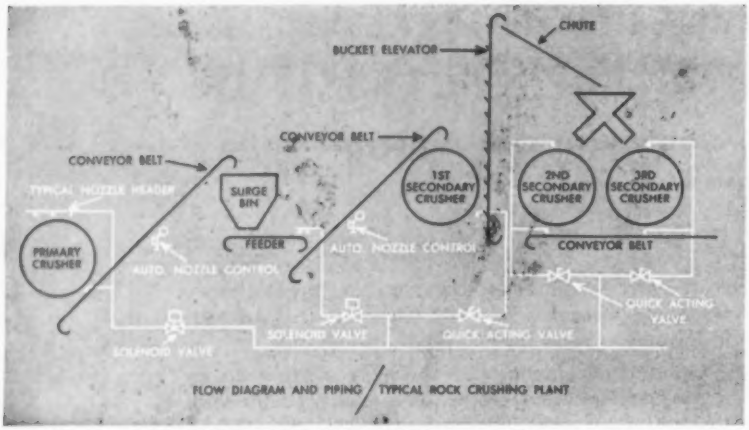
Grinding mills are on the grow. The single mill conserves floor space and affords better quality control with its improved circuits. Watch for the 2500 and 3000-hp Allis-Chalmers mills soon to be announced.

ALLIS-CHALMERS

See your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

A-3936-CM

JOHNSON MARCH ► chem-jet DUST CONTROL SYSTEM



DUST PROBLEM SOLVED economically at typical rock crushing plant. Drawing shows location of Chem-jet applications after system was engineered by Johnson-March.

NOW YOU CAN AFFORD DUST CONTROL

At a fraction of the cost of other methods, Chem-jet brings you efficient, practical dust protection. Chem-jet solves your dust problem by attacking dust at its source. It is the only system of its kind that effectively *prevents* dust from becoming airborne.

- **Low-Cost Dust Control—**

  No other system compares to Chem-jet for low first cost, low operation and maintenance.

- **Each Installation Engineered—**

  To solve each specific dust problem, Chem-jet systems are specially engineered to meet all requirements.

- **Effective Dust Control—**

  Carries through from crushers to stock pile without affecting screens.

Engineering analysis of your dust problem will be made at no obligation. Johnson-March Corporation, 3018 Market Street, Philadelphia 4, Pa.

JOHNSON MARCH DUST CONTROL ENGINEERS

Enter 46 on card, page 155

Aug. Construction in Place Found Rising in Survey Of U.S. Bureau of Census

The value of new construction put in place in August amounted to $5,300,000,000, according to preliminary estimates of the Bureau of the Census, U. S. Department of Commerce. This is an increase of 1 percent over July, slightly less than the normal seasonal rise between July and August. August, 1959, was 13 percent over August, 1958. The total value of work put in place in the first 8 months of 1959 is $35,700,000,000 15 percent ahead of the same period in 1958.

The physical volume of new construction put in place in the first 7 months of 1959 is estimated to be 13 percent above the volume for the corresponding 1958 period.

Outlays for new private construction in August total $3,600,000,000, about the same as in July, following the normal seasonal pattern. For the first eight months of 1959 the total is $24,800,000,000, or 16 percent above the same period in 1958. New residential construction shows a small contraseasonal decline in August to about $2.1 million; consequently the seasonally adjusted annual rate dropped about 3 percent, continuing the decline from the May, 1959, peak. However, the August, 1959, expenditures for new residential are 22 percent above the 1958 level, and expenditures for the first eight months of 1959 are 31 percent ahead of the first eight months of 1958. Private industrial expenditures are up 2 percent over 1958.

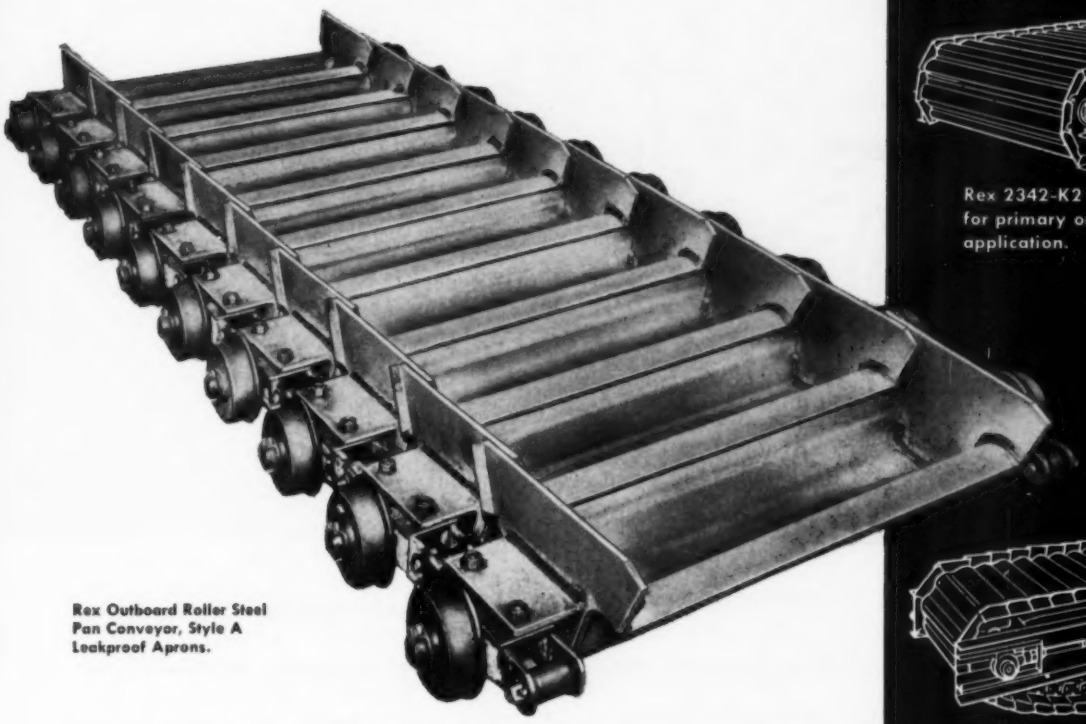
Expenditures for public construction show a normal rise in August to $1,700,000,000. For the first eight months of 1959, the value of work put in place is $10,800,000,000, 14 percent above the same period in 1958. Nearly all types of work share in this increase. However, the eight-month total of expenditures for educational building is down 4 percent from 1958.

Frank G. Baulne, Inc., Spokane road construction firm, has purchased the Marble, Wash., dolomite quarry near Colville from the Federal Government.

Enter 47 on card, page 155 →

Another PLUS value...

How to convey hot bulk materials with initial temperatures up to 1900°



Rex Outboard Roller Steel Pan Conveyor, Style A Leakproof Aprons.

Rex Outboard Roller Steel Pan Conveyors provide a practical solution to many unusual conveyor problems.

Unique construction assures longer life—eliminates many replacement costs down through the years—holds down time and maintenance costs to a minimum.

Here are two of the ways improved Rex design gets right to the heart of the heat problem:

1. Chain and rollers are insulated from maximum temperature heat zone.
2. Carbon steel pans, with large pan surfaces, provide maximum heat transfer.

Long wear life, easy maintenance—Ruggedly built for extra stamina, Rex Outboard Roller Steel Pan Conveyors are known for their long, trouble-free service. Wear is confined to heavy outboard rollers; square through rods connecting the chains assure rigidity, equal load distribution; and outboard roller design permits easy servicing without disassembly of chain or conveyor.

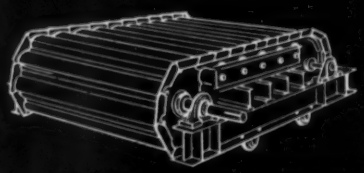
Preferred throughout industry—Deep pan construction, shown above, is ideally suited for use in a wide range of heat processing applications; for example: calcining, sintering, briquetting, beneficiating and nodulizing. This style is available in a wide range of sizes.

Other types available for every service—For information on how Rex Apron Feeders, Apron and Pan Conveyors can help you cut production costs, write CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

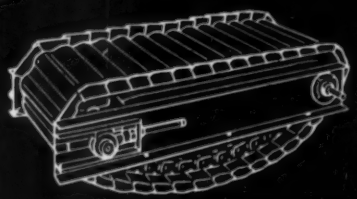
REX®

OUTBOARD ROLLER STEEL PAN CONVEYOR

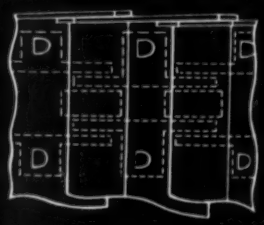
Types For EVERY Service

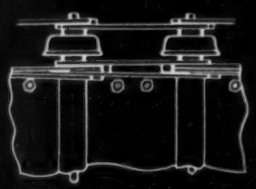


Rex 2342-K21 Heavy-Duty Feeder for primary or secondary application.



Rex 531-K17 Light-Duty Apron Feeder, used under hoppers and bins to regulate material flow.





Style A aprons with Type K or A chain attachments furnished as machinery parts for many applications.

"This baby's a 'brute' for earthmoving . . .

GOT HER BLADES HARDSURFACED WITH **EASYARC 620"**

AIRCO EASYARC 620 HARDFACING WILL INCREASE PERFORMANCE AND LENGTHEN LIFE OF EQUIPMENT SUBJECT TO SEVERE ABRASION AND MODERATE IMPACT

Service conditions that give your equipment severe abrasion, moderate impact and hot wear up to 1100° F.—or any combination of these conditions—set your stage for the benefits of hardsurfacing with Airco Easyarc 620. Typical industrial applications are "Wearsharp" pockets, scraper blades, light aggregate hammers and coke pusher shoes. Operators get high welding speed with Easyarc 620 because it accommodates high amperages.

TO IMPROVE ALL YOUR HARDFACING WORK—AND ALL YOUR WELDING—CALL IN YOUR AIRCO MAN

Airco experience covers the whole field of hardfacing, and for welding Airco makes hundreds of electrodes of all classes and types. Airco produces all industrial gases, equipment and supplies for welding and hardfacing. We want to make this broad experience yours. Just call your nearby Airco office or Authorized Airco Dealer. You'll find them listed in the "Yellow Pages" under "Welding Equipment and Supplies."

AIRCO EASYARC 620 is a composite, heavily coated iron powder type electrode. It utilizes high-speed steel core wire with additional alloys in the coating. Deposits are flat and smooth and the rod develops high hardness on cooling.

AIRCO

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.
Offices and authorized dealers in most principal cities

On the west coast — Air Reduction Pacific Company
In Cuba — Cuban Air Products Corporation
Internationally — Airco Company International
In Canada — Air Reduction Canada Limited

All divisions or subsidiaries of Air Reduction Company, Inc.

Enter 48 on card, page 155

4 Major Cement Concerns Report Higher 6-Mo. Profits

Net income of Penn-Dixie Cement Corporation for the six months ended June 30, 1959, amounted to $3,684,733, an increase of 26.6 percent over the $2,910,219 net profit in the first six months of 1958.

Sales in the first half of 1959 totaled $21,374,859, an increase of 8.9 percent from the sales of $19,631,481 recorded in the similar period of 1958.

American Cement Corporation net earnings after all charges and taxes amounted to $2,931,135, a 21 percent increase compared with $2,416,307 in 1958. Billings increased by 13 percent to $25,560,112 from $22,544,933 in the year-ago half. Earnings equal 67 cents per share, up 13 cents.

Ideal Cement Company reported net income (before taxes) of $14,939,222 against last year's six-month total of $10,665,884—a 40 percent increase. Net sales for the period are up 23 percent, to $47,171,769 from $38,366,777. Both are reported running at record rates so far in 1959. Earnings (after taxes) equal 88 cents per share, up 26 cents.

Marquette Cement Manufacturing Company reports receipts of $25,284,730 and net earnings (after taxes) of $3,910,793, compared with receipts of $22,762,403 and net earnings of $3,468,182 in the same period during 1958—increases of 11 and 13 percent respectively. Earnings equal $1.46 per common share, up 17 cents.

Israeli Cement Exports Rise—U. S. Becomes New Market

Export sales of Israeli cement during the first months of 1959 have recovered sharply, following the 25 percent decline last year. Sales exceed even the monthly peaks attained in the record years of 1956 and 1957.

New markets have opened up in West Africa, East Africa, the Far East and the United States. During January-April, 1959, 30,000 tons went to the U. S. alone.

Total exports from Israel during 1958 amounted to 145,000 tons.

Enter 49 on card, page 155 →

CALL THE MAN WHO

makes your conveyor dollar carry more, last longer

Here's how you can be sure of top conveyor efficiency and economy: include a CHAIN Belt Conveying Engineer on your planning team. He's well qualified in two ways to help your team find the right system for your specific needs: 1. He offers you the industry's most complete selection of belt conveyor components such as idlers, pulleys, bearings and take-ups—assuring the most efficient design for every application. 2. He's an application expert—offering you many years of experience in selecting the right conveyor system for the job.

As a result, you get top efficiency in your system and you save because you cut initial, operating and maintenance costs. You keep down time to a minimum with trouble-free operation and longer conveyor life. You move maximum tons at lowest cost.

Whether you are planning a new system or expanding existing units, call in your CHAIN Belt Conveying Engineer. He will help your planning team get better results. Contact your nearest CHAIN Belt District Office. Or write CHAIN Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

REX®

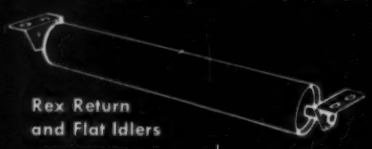
CONVEYOR SYSTEMS AND COMPONENTS

Another PLUS value...

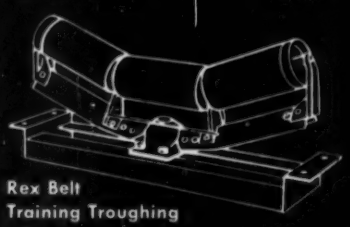
REX® Conveyor components

Complete line of idlers and pulleys Rex-Rated for every type of service

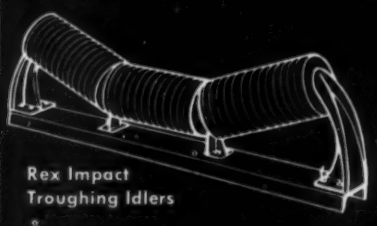
Rex Troughing Idlers



Rex Return and Flat Idlers

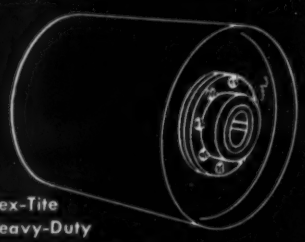


Rex Belt Training Troughing Idlers

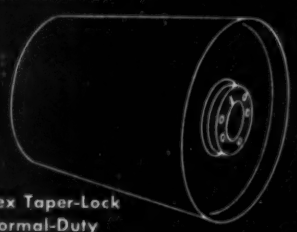


Rex Impact Troughing Idlers

Rex Spiral Return Idlers



Rex-Tite Heavy-Duty Conveyor Pulleys



Rex Taper-Lock Normal-Duty Conveyor Pulleys

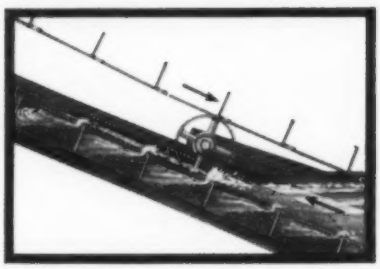
CLEANER SANDS . . .

more efficient de-sliming
. . . with the "OVERDRAIN" Classifier

The "Overdrain" Classifier is a completely new device in the field of mechanical wet classifiers. The belt, with lifting flights attached beneath, moves upwardly out of the sand bed between two stationary side shrouds—creating the effect of a series of moving, closed, washing compartments.

The only outlet from these compartments is via holes in the belt above. Surplus liquid and slimes discharge through these "overdrain" holes without mixing with the oncoming sands. The end result is an extremely clean sand discharge, excellent de-sliming—making the "Overdrain" Classifier an ideal washing device.

Write for Hardinge Catalog 39-C-8



Section through "Overdrain" Classifier showing upward-moving, closed, washing compartments.

Unretouched photograph of "Overdrain" action above the belt—water and slimes discharging upwardly.

HARDINGE
COMPANY, INCORPORATED

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Enter 50 on card, page 155

Bureau of Mines Research On Clay, Shale Important To Lightweight Aggregate

A major project in U. S. Bureau of Mines research in domestic nonrefractory clays in fiscal year 1960, which began July 1, will be a search for bloating clays and shales to establish adequate supplies of lightweight aggregate. The Bureau also will continue research on beneficiating kaolin and halloysite to increase recoveries and improve their properties.

Use of lightweight aggregates, particularly in concrete, is increasing rapidly and this trend is expected to continue, Bureau spokesmen said, pointing out that thermally expanded clay, shale, and slate will play an important part in meeting increased demand.

Bureau engineers will sample and test clays from selected deposits in several states in the Midwest, Northeast, and Southeast, including Minnesota, Wisconsin, Iowa, Indiana, Illinois, Florida, Connecticut, Rhode Island, and Maryland.

In other clay-research work Bureau metallurgists will continue research to improve beneficiation processes for kaolin from the Southeast and halloysite from the Northwest. Research on nonrefractory clays is proceeding at Bureau stations in College Park, Md.; Norris, Tenn.; Minneapolis, Minn.; Tuscaloosa, Ala.; Pittsburgh, Pa.; Bartlesville, Okla.; Reno, Nev.; and Seattle, Wash.

Fuller's Earth Production Shows Slight Drop in 1958

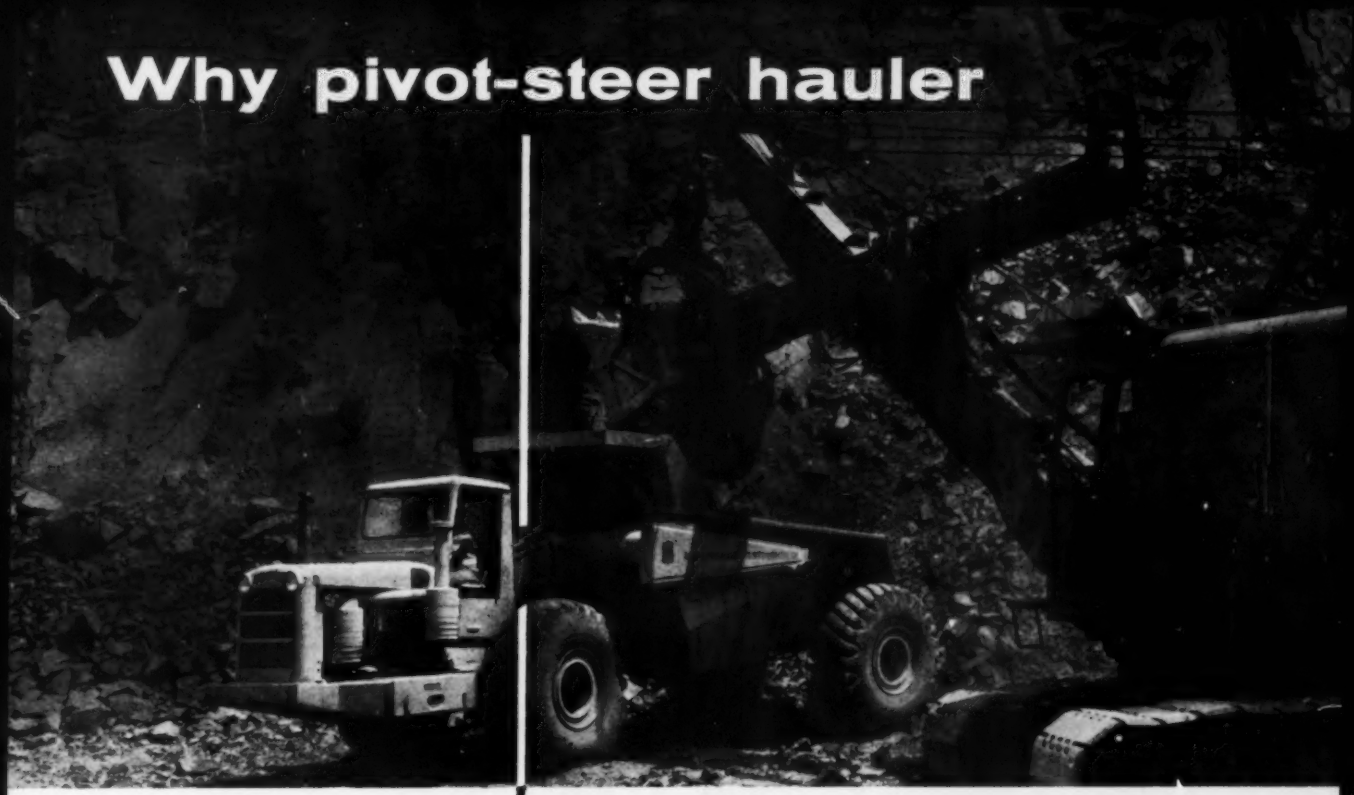
Production of fuller's earth decreased 2 percent in tonnage and 6 percent in value in 1958, compared with 1957, according to reports from domestic producers to the U. S. Bureau of Mines.

In 1958 Florida furnished 59 percent of the United States total production of fuller's earth, Georgia 23 percent, and Tennessee 8 percent. Production decreased 6 percent in Florida and 22 percent in Tennessee, but increased 7 percent in Georgia and 6 percent in Utah.

The average value of fuller's earth reported sold or used in the United States in 1958 was $21.26, per short ton.

Enter 51 on card, page 155 →

Why pivot-steer hauler



cuts equipment downtime... boosts pit output... lowers handling costs...

Rugged, simplified construction is one big reason why speedy LeTourneau-Westinghouse Tournapull® Rear-Dumps keep working efficiently day after day... year after year... to help pit owners cut costs. Notice that on this machine there are no springs, no tie rods, no hose and pipe lines, no frame, no long drive-shaft to require maintenance and repair.

In place of a foundation frame and body sub-frame, Tournapull prime-mover and trail-unit are hitched together by means of a high horizontal yoke. Yoke pivots horizontally on kingpin at front... then extends back along side of bowl, where it pivots vertically just above and ahead of rear wheels. This unique vertical and horizontal kingpin arrangement also provides an easy oscillating action that eliminates most twisting, tilting strains ...permits higher working speeds on uneven ground to boost pit output.

Resists heaviest loading jolts

Shovel operator does not have to take it slow and easy when loading heavy materials. L-W Rear-Dump bowl is all steel — no wood fillers. Triple-layer floor is lined with heat-treated tool-steel strips, welded to solid billets laid over heavy steel plate. Sloping sides deflect load shock, quickly cushion floor area with layer of material to minimize rock damage.

Tire, clutch, transmission wear reduced

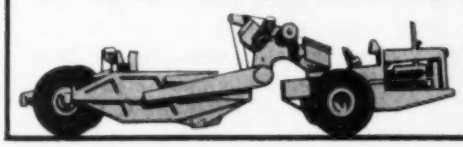
Costly wear on tires, clutch, and transmission caused by spinning wheels in slippery or loose footing, is minimized with Tournapull Rear-Dump. When either powered wheel begins to spin, unit's exclusive L-W power-transfer differential automatically diverts up to 80% of power to drive wheel on firmest footing. Also, electric 90° pivot-turn through geared kingpin, lets operator "walk" prime-mover out of mud or loose sand. Dumping action can also be used to "hump" empty hauler off a soft bank.

Features like these — plus full 90° turns, efficient electric-controls, fast, clean dump, giant air brakes, excellent visibility — add up to high production and low costs. Let us show you a LeTourneau-Westinghouse Tournapull Rear-Dump in action. Available in 3 sizes: 11, 22, and 35 tons.

R-1892-MQ-1

Bonus interchangeability feature

For less than ¼ the cost of an L-W Tournapull prime-mover with Rear-Dump, you can get an easy-loading L-W scraper to interchange with original Rear-Dump trail-unit. Change-over — using same 2-wheel prime-mover — takes just a few hours. Use scraper to lower dirtmoving costs on stripping operations, haul-road or drainage construction, and for exploratory mining. Other trail-units to increase prime-mover's usefulness also available.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

ANY WAY YOU LOOK AT IT...

NEW

Rubber Spiral Idler lasts far longer, prevents build-up of sticky materials

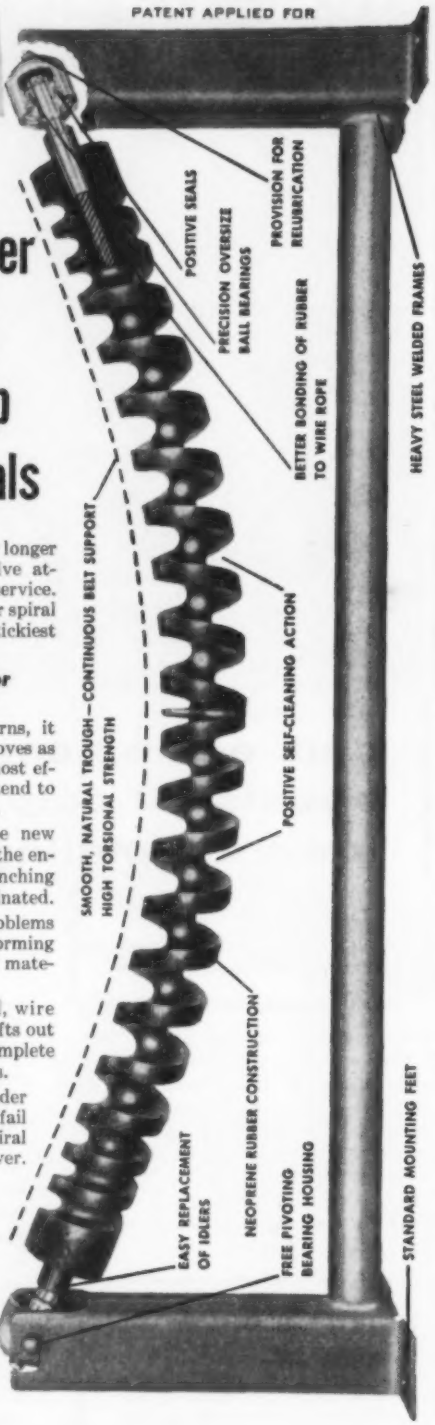
This new rubber spiral idler lasts far longer than conventional idlers in corrosive atmospheres or exceptionally abrasive service. And its exclusive self-cleaning rubber spiral prevents build-up of even the stickiest materials.

Here are some of the rubber spiral idler's advantages:

- **SELF CLEANING.** As the spiral turns, it "works" any material out of the grooves as they change shape. This action is most effective with sticky materials which tend to build up on common types of idlers.
- **CONTINUOUS BELT SUPPORT.** The new rubber spiral design "moves" along the entire width of the belt; therefore, pinching and sharp bending of the belt are eliminated.
- **SELF TRAINING.** Belt training problems are greatly reduced by readily conforming rubber spiral, and by elimination of material build-up.
- **EASY REPLACEMENT.** The spiral, wire rope, and bearing assembly simply lifts out of its brackets—no tools needed. Complete idler fits standard conveyer stringers.
- **TRUE OPERATING ECONOMY.** Under conditions where conventional idlers fail prematurely, the Hewitt-Robins spiral idler will pay for itself many times over.

Deliveries of this revolutionary new idler are now being made in 18, 24, 30, and 36 inch belt sizes.

For further information check your H-R distributor, or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 10-24.



HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N. Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N. J. Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

Enter 52 on card, page 155

Obituaries

ROBERT L. WALKER, 43, general manager and a member of the board of directors of the Federal Crushed Stone Corp., Buffalo, N. Y., died recently. Mr. Walker served about twelve years at the company's Cheektowaga quarry in various capacities, becoming quarry manager and a company director. Mr. Walker was a son-in-law of one of the founders of Federal Crushed Stone, HUGH MCNABB, who preceded Mr. Walker in death by two months.

C. E. FEASTER, founder of the Oxford Sand and Gravel Company, Oxford, Kans., in 1935, died unexpectedly in Wellington, Kans., on his 70th birthday. In 1956, a partnership was formed by Mr. Feaster and his three sons, and in May of this year, they purchased and began operating the Wellington Material Company in Wellington.

T. J. MCCARTHY, 69, retired manager of the Blair Limestone Division of Jones & Laughlin Steel Corp., died recently in Logansport, Ind., where he had been living since his retirement. Associated with limestone production for over 50 years, he had been a Blair Division superintendent for 25 years.

JOHN H. DALBEY, 85, a former sales manager of the old Dixie Portland Cement Company, died recently in Knoxville, Tenn. Mr. Dalbey was with Dixie Portland in 1926 when it merged with Penn-Dixie, and for a time was the company's sales manager in Des Moines, Iowa. He joined the staff of the Cumberland Cement Company, at Cowan, Tenn., around 1928, and was with that company until his retirement about ten years ago.

EARL C. SNYDER, superintendent of Bailey Limestone Company of Kirksville, Mo., died recently at the age of 53. He was Bailey superin-

YOUR GRADER—

PRODUCTION TOOL?

...or OVERHEAD?

Chances are, you consider a grader a maintenance tool . . . a kind-of "necessary evil." But is it just that?

Think how a grader keeps haul roads in top-speed shape — thus increasing the number of round-trips your haulers can make daily. Or think of the extra working days you gain because ditches, cut by a grader, let water run off faster.

Objective . . . increased production

The net result of most grader work in mines, quarries, and pits, is higher output . . . increased production. In a sense, the extra tonnage you get — due solely to work of your graders — is really *their* production. It's output you wouldn't get without graders . . . couldn't get without added expense.

So! While your grader may be a "maintenance" tool in function, it is actually a "production" tool in results. That's why you will want to select your graders carefully, on the basis of work-output. You'll want machines that can handle *all* your blade-work *fast* . . . that can help you get the "last ounce" of tonnage with your production equipment.

L-W "660" does more work, faster

You'll find that a big L-W Adams† 660 grader can cut deeper, push more dirt, move it faster than other graders of similar size, price, and power. "660" gives you greater work-output than others — mainly because of its wide selection of power-speed combinations, which let you do more of your work at full engine-power. The L-W grader also provides extra, faster forward and reverse speeds to save you time on traveling, maneuvering, and backing-up for the next cut.

This profit-boosting grader is offered in 2 power options: Standard "660" with 160-hp diesel and constant-mesh transmission, or POWER-*Flow*® 660 with 190-hp engine and torque converter. Five other L-W Adams model graders — 67 to 145 hp — also available.

Call or write for complete information about features that make LeTourneau-Westinghouse machines the most profitable graders you can own.

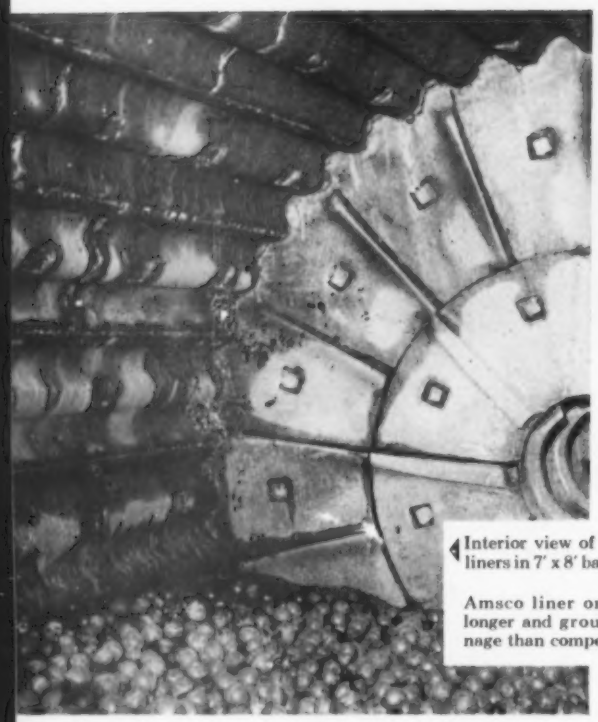
†Trademark G-1884-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

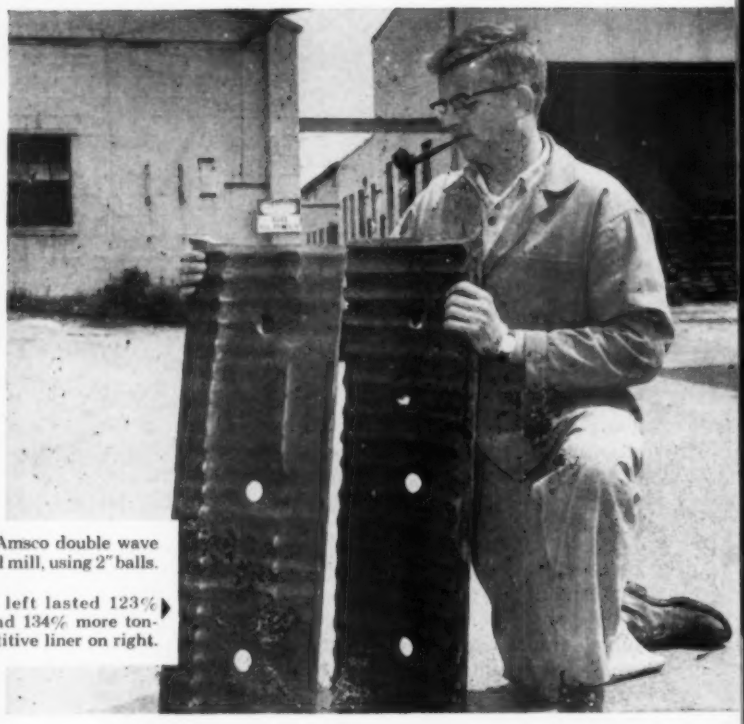
Where quality is a habit

How AMSCO helps you HANDLE



Interior view of Amsco double wave liners in 7' x 8' ball mill, using 2" balls.

Amsco liner on left lasted 123% longer and ground 134% more tonnage than competitive liner on right.



Bucyrus 88 D four-yard bucket, equipped with Amsco Simplex 2-part Teeth, removing rock for power station. All of Tuscarora Constructors' shovels used for rock excavation are equipped with Amsco Simplex Teeth.

MORE TONS PER DOLLAR

Read how AMSCO Mill Liners and Dipper Teeth are outlasting competitive parts in severe service

THEY'VE DOUBLED SERVICE LIFE WITH AMSCO CHROME-MOLY BALL MILL LINERS

Amsco double wave chrome-moly liners are used on an Allis-Chalmers 7′ x 8′ ball mill at this large northern New York zinc mine. The mill is operating *24 hours a day, six days a week* . . . grinding rod mill discharge consisting of sphalerite, pyrite and the balance silicate and limestone gangue.

These Amsco liners ground 670,000 tons during their 29-month life . . . as against an average of 286,000 tons and 13-month life for the type of liners previously used. That adds up to over *100% increase in service life.* In addition to their longer life, another fact that impresses the operators about Amsco liners is that there's no circumferential grooving until the very end of their service life.

AMSCO 2-PART DIPPER TEETH ARE "BEST-WEARING TEETH WE'VE EVER USED"

At the Niagara Power Project, Tuscarora Constructors are building the power station and pumping station. They're digging almost entirely in rock, working their dippers 24 hours a day, six days a week.

Dell Lundmark, Equipment Superintendent for Tuscarora, was responsible for selecting Amsco 2-part reversible teeth for his dippers. He'd heard of their fine performance elsewhere, and now describes them as the "best wearing teeth we've ever used". He says the design of the teeth is very good for rock, and adds, "We're getting *15% to 20% longer wear* than from competitive 2-part teeth".

Approximately 10,000 tons of rock are handled before the teeth are turned over . . . and tips are easy to replace when completely worn.

This combination of a new alloy steel, plus the design features engineered into the Amsco Simplex Teeth, are causing equipment superintendents everywhere to change to Amsco for better, lower cost digging.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other Plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

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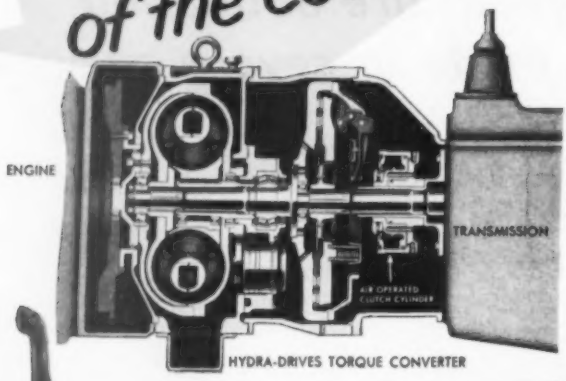
Now! Many Of The Advantages Of Power Shift Transmission *at a fraction of the cost!*

HYDRA-DRIVES®

TORQUE CONVERTER WITH A STICK SHIFT TRANSMISSION!

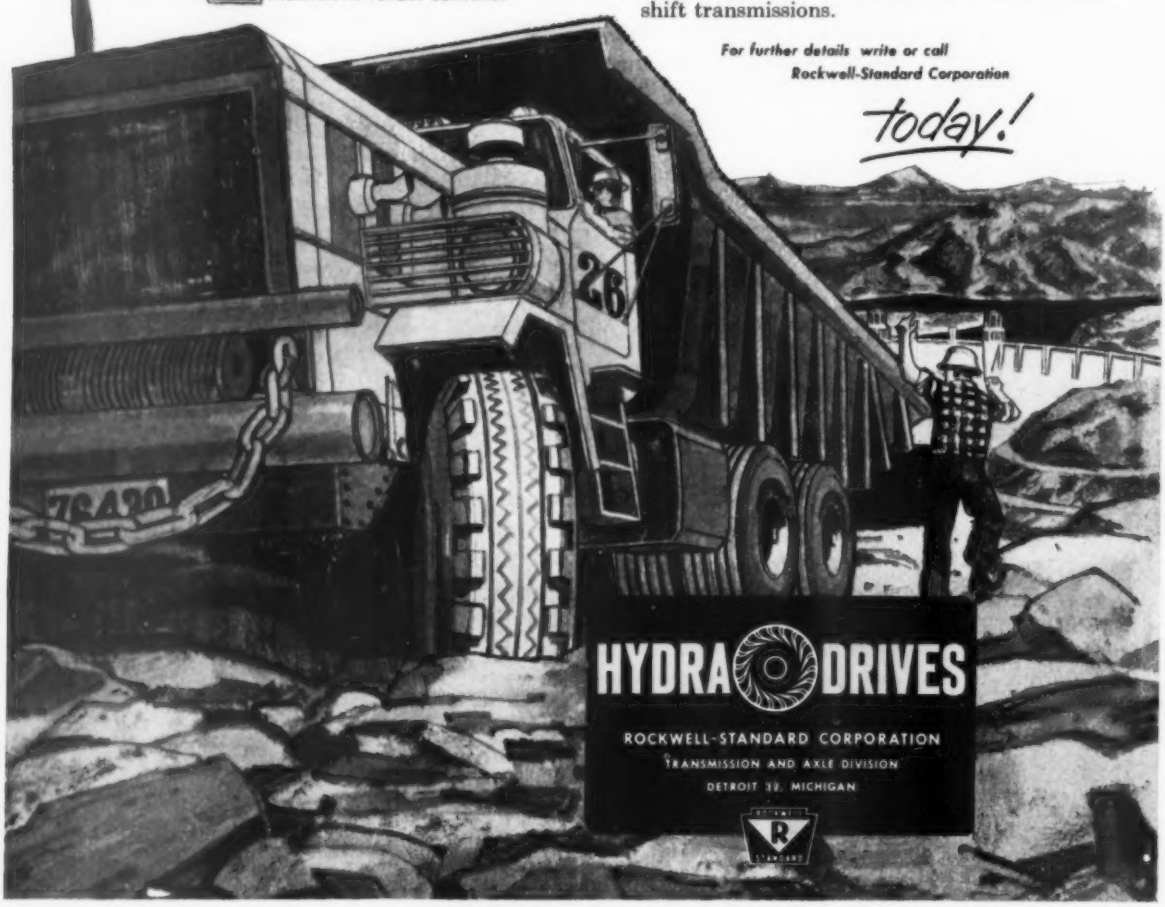
Lower in initial costs, Rockwell-Standard's Hydra-Drives Converter with stick shift transmission reduces operating and maintenance costs on heavy-duty off-highway trucks. You get these five major advantages plus many others:

1. Up to 80% of shifting is eliminated. Select a transmission ratio to fit the haul, and let the converter handle the changing load conditions with a minimum of gearing. Any required shifting can be done while truck is in motion!
2. Greatly reduces shock loading on all drive components.
3. Clutch adjustments and wear problems minimized.
4. A minimum of driver training is required.
5. Cost is hundreds of dollars less than full power shift transmissions.



HYDRA-DRIVES TORQUE CONVERTER

For further details write or call
Rockwell-Standard Corporation
today!



ANOTHER PRODUCT OF **ROCKWELL-STANDARD** CORPORATION

tendent for the last ten years. He had been engaged in limestone quarry operations throughout southern Iowa for most of his working life.

CLARENCE A. BARRON, a director of the Salisbury Portland Cement Company, died recently in Cape Town. Mr. Barron was also serving as vice-chairman of the Central Africa Building Society at the time of his death.

ANDREAS N. HADJIKYRIACOS, 83, chairman of the board and managing director of General Cement Company S.A. (Heracles-Olympos) of Athens, Greece, died in Athens on June 13 after a long illness. He had held these positions since 1917.

FRED ROSS MCAMIS, 66, a retired assistant superintendent of the Ash Grove Lime and Portland Cement Company plant at Springfield, Mo., died recently in Springfield after a long illness. Mr. McAmis served for more than 40 years with the company.

THOMAS N. HAYDEN, 77, Houston, Tex., died on June 11 after an illness of several weeks. He had been a salesman for Trinity Division of General Portland Cement Company for 50 years, retiring in 1957 to become a consultant for the company.

WILLIAM P. GANO, 74, died at his home in Nazareth, Pa. Mr. Gano was chief chemical engineer of the northern division of the Penn-Dixie Cement Corporation, New York, N.Y., until his retirement in 1954.

OWENS H. HOLMES SR., 63, a representative of the Lehigh Portland Cement Company for 22 years, died recently in Jacksonville, Fla.

GERTRUDE M. FANNING BUCKLAND, widow of John M. Buckland, died recently in Allentown (Pa.) Hospital. She had succeeded her husband as president of the National Slag, Sand and Gravel Company in Riegelsville after his death in 1939, and remained as president until she sold the company in 1954.

LISTER GAINES, 77, a former vice-president of the Kentucky Stone Company, Louisville, Ky., died recently in Lawrenceburg, Ky. He had been associated with several stone companies for more than 50 years; he retired in 1958.

CHARLES FRITH, 71, died recently in Dubuque, Iowa. Mr. Frith, who retired in 1955, was a Marquette Cement Manufacturing Company sales representative in Wisconsin and the city of Dubuque.

ROBERT C. BROWN, 62, of Haddonfield, N. J., died recently. Mr. Brown was the Philadelphia district sales manager for Coplay Cement Company, Coplay, Pa., retiring in 1956 after 25 years service.

ALBERT STOTZ, 67, owner and operator of the Al Stotz quarry at Prairie du Rocher, Ill., died recently. Mr. Stotz opened the quarry in 1938, and it has operated continuously since that time, supplying agricultural lime and crushed stone.

DETACHABLE ROCK BIT GRINDER CUTS DOWN-TIME – LENGTHENS BIT-LIFE

BLOUNT machine-sharpens carbide-tipped rock drills far more accurately than any operator, however skilled, can by hand — and up to five times faster!

When you recondition your rock bits on a BLOUNT GRINDER, you can be sure of a uniform, symmetrical grinding job, including the exact angles the manufacturer intended.

Put a BLOUNT GRINDER to work for you, and get the savings so many customers report!

- ★ Longer bit-life — more regrinds per bit
- ★ Faster drilling
- ★ Reduced drilling upkeep
- ★ Lower cost per foot of drilling

PARTIAL USER LIST
Blount Bit Grinders:

Merritt Chapman & Scott Company, New York
Balf-Savin & Winkelman, New York
Shea-Kaiser & Morrison, California
Orinoco Mining Company (Subsidiary of U. S. Steel), Pennsylvania
Arch Dam Constructors, Utah
Subsidiary Companies of Bethlehem Steel Corp., Pennsylvania
Mount Vernon Contracting Corp., New York
Hanna Iron Ore Division (National Steel Corp.), Michigan
Jones & Laughlin Steel Corp., New York
Merritt Chapman & Scott Corp. of Panama, Balboa Canal Zone
James D. Morrissey Inc., Pennsylvania

J. G. BLOUNT Co.
Everett 49, Massachusetts
Div. Bowl-Mor Co., Inc.

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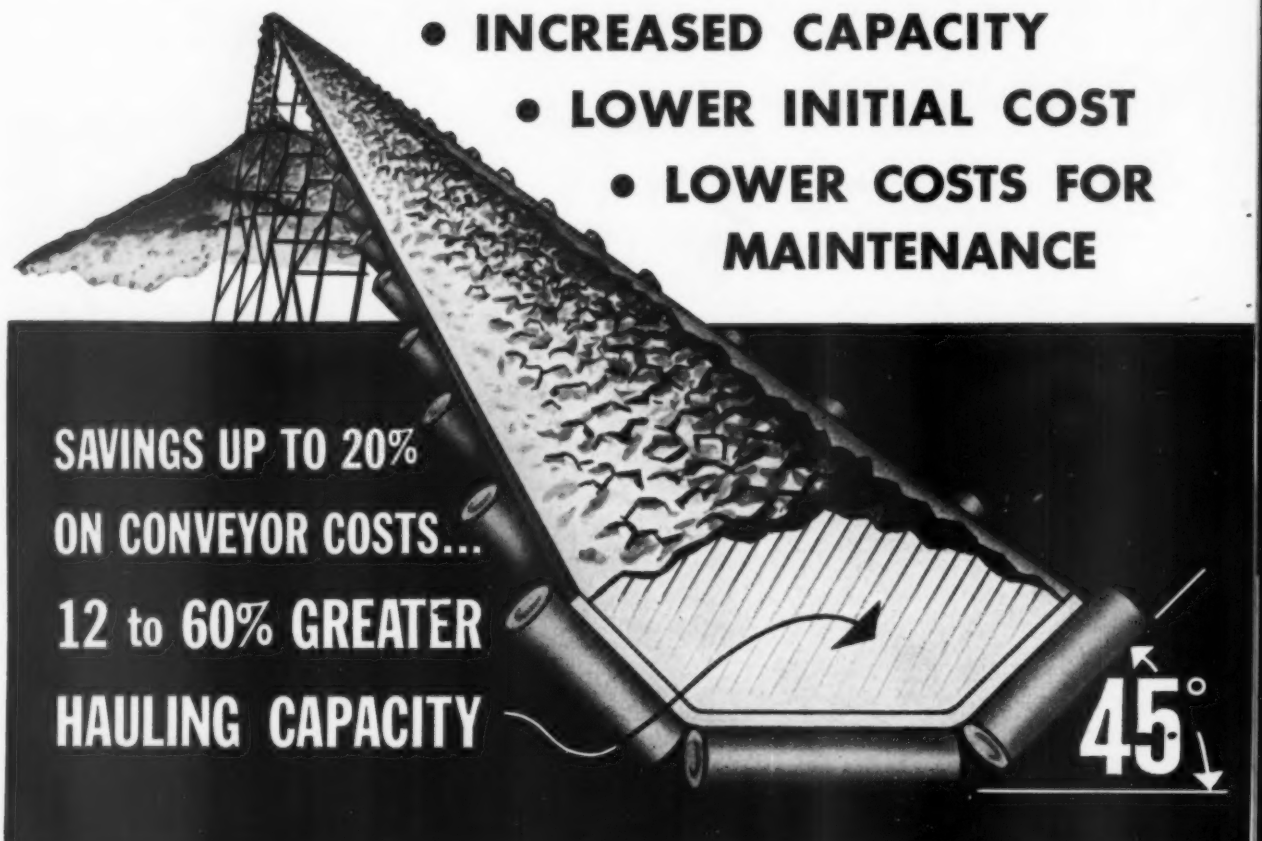
MOST IMPORTANT NEWS

NOW YOU CAN USE 45° IDLERS

- INCREASED CAPACITY
- LOWER INITIAL COST
- LOWER COSTS FOR MAINTENANCE



It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

Ray-Man's exclusive flexible construction and built-in stress compensation is guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

RAY-MAN GIVES YOU "*MORE USE PER DOLLAR*" WITH 45° IDLERS

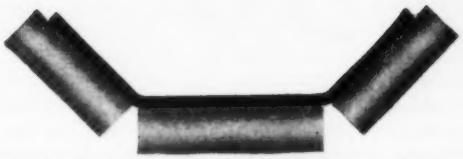
IN CONVEYING TODAY!

...TO HANDLE ALL MATERIALS

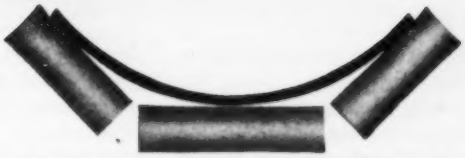
BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS

20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE

Only RAY-MAN CONVEYOR BELT is BUILT to take the EXTRA STRESS OF 45° IDLERS



RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° ANGLES

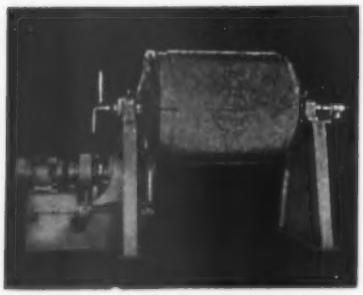
Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar . . . write for new Bulletin M303, "Ray-Man for 45° Idlers."

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

RM-961
ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR

new machinery



• The Patterson Mil-Reactor, a new tool for performing multiple operations in a single processing unit, is introduced by The Patterson Foundry and Machine Company.

Combining the functions of a ball mill and a reactor, the unit makes possible grinding in the presence of carefully controlled temperature and pressure conditions. Access lines permit the addition of liquids, slurries, or gases while in operation.

The Mil-Reactor will mix materials uniformly while they are being reacted, maintaining desired heat transfer rates and producing material of desired particle size. It is available in sizes from 5- to 500-gal. working capacity.

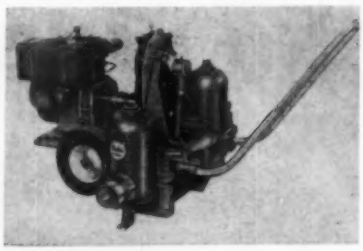
Processes in which the Mil-Reactor may be used include handling of solids as slurries, drying, reacting with gas, then re-slurrying; fine wet grinding of solids and removing as fine slurry of product; addition of solids as slurry, drying, reducing size, re-slurrying and removing slurry. (351)

• Baldwin-Lima-Hamilton Corporation has introduced a 5-cu. yd. loader which does its own digging and converts quickly into a 1¼- or 1½-cu. yd. shovel; a 40- or 50-ton crane; a variable capacity dragline; or a 1¼- or 1½-cu. yd. pull shovel.

A long (9 ft. 10 in.) horizontal movement of the bucket and a 360-deg. swing permit the bucket to dig into an embankment or stockpile, fill completely, and swing to any point for dumping—all without moving the crawler chassis.

The bucket has a maximum dumping height of 16 ft. 10 in. at an 18-ft. radius, allowing the new loader to dump over the end or sides of trucks. It is hydraulically-operated and tilts to an angle of 52 deg.

Features of the basic Lima Type 64 machine include choice of gasoline or diesel power; long or short crawlers; and independent propel. Main and auxiliary machinery is air-controlled. It has large diameter hoist, crowd, swing, and propel clutches and independent boom hoist, with engine-controlled boom lowering. (352)



• Marlow Pumps, Division of Bell & Gossett Company, has added two models to its line of lightweight aluminum diaphragm pumps. An electric motor unit (illustrated) is known as the Model 302B-EL, while a gasoline engine unit is designated as the Model 302B-1.

Both units have 3-in. male-threaded suction and discharge. They use standard diaphragms and have replaceable rubber flapper valves. The valves and valve seats can be replaced quickly if required. The gear case and pump body are made of cast aluminum. The body has a readily accessible clean-out and drain hole. Either model is available as a base or wheel-mounted unit.

The electric motor driven Model 302B-EL has capacities up to 71 g.p.m. at 56 strokes per minute. While slightly more compact than the gasoline engine driven pump, the Model 302B-EL is 23 lb. heavier. The Model 302B-1 has a capacity of 76 g.p.m. at 60 strokes per minute using a governored engine speed of 1,850 r.p.m. It weighs 158 lb. base mounted and 169 lb. wheel mounted. (353)

• A new insulation material, Hyrad-FR, has been developed by the Sequoia Wire and Cable Company, a subsidiary of the Anaconda Wire and Cable Company. Hyrad-FR is described as retaining the excellent electrical properties of polyethylene, but with greatly improved heat stability and cold flow resistance—plus flame retardance.

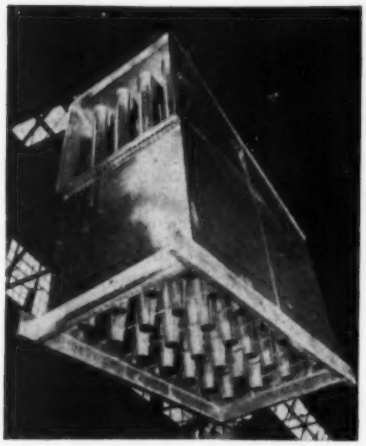
Electron streams bombarding an insulated wire cause a cross-linking of the polyethylene molecules. This

and equipment

for further information use card on page 155

changes the plastic from a two-dimensional molecule, which is a thermally sensitive thermoplastic, to a three-dimensional, thermally-stable thermosetting configuration.

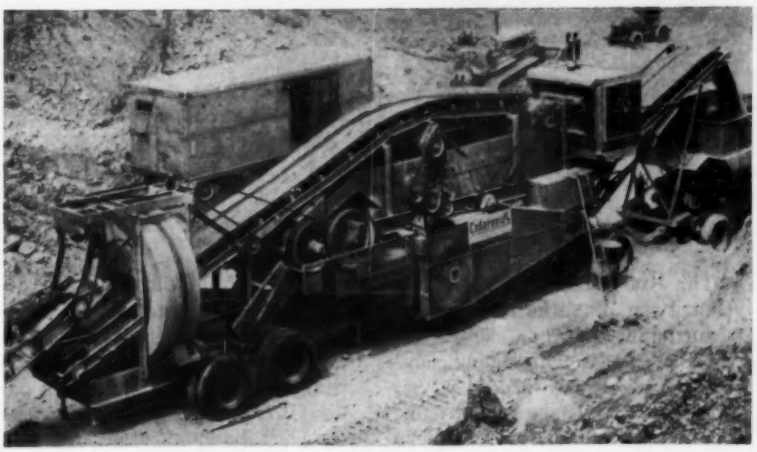
One of the features of Hyrad-FR is its ability to withstand a soldering operation without being damaged. This feature permits a circuit designer to take advantage of an insulation with good electrical properties equal to polyethylene but capable of going through soldering operations for assembly. (354)



• A new vertical tube mechanical dust collector, especially designed to reduce plugging, is now available from the American-Standard Industrial Division. Although specifically designed for use in main kiln or clinker cooler cement plant installations, the Series 345 collector is recommended for any applications where tube plugging in smaller tube collectors is normally a problem. Collection efficiency is compatible with normal primary collector requirements where a secondary electrostatic precipitator or silicone glass bag is to be utilized.

The new unit contains 15-in. vertical steel inlet tubes which have large openings and smooth wall surfaces for free passage of dust-laden gas or air. These large diameter tubes are designed with tapered outlet to provide optimum collection efficiency, eliminate re-entrainment, and reduce plugging.

Ruggedly built, the Series 345 dust collector is of all-welded construction. It is factory-assembled and its design utilizes the sectionalized or modular construction concept whereby each unit is built up as a combination of collector sections to meet a specific set of dust collection requirements. (355)



• Armorline, an abrasion-resistant, adhesive rubber sheeting for do-it-yourself covering of chutes and launders or patching of conveyor belt surfaces, has been developed by the B. F. Goodrich Industrial Products Company.

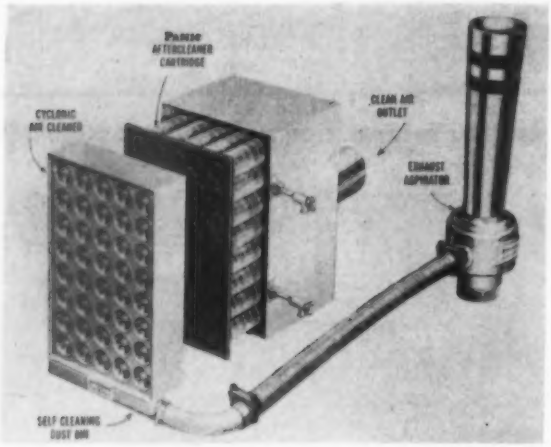
Highly abrasion-resistant, Armorline can be applied easily to metal, concrete, wood, and other materials. A thin gauge of tacky rubber is bonded to the bottom side of the material, protected by Holland cloth which is removed before use. Neither expensive tools nor special skill is required for covering or patching equipment in the field.

Armorline comes in rolls 50 or 75 ft. long, depending on the gauge of the material, and 48 in. in width. Gauges are 1/16, ⅛, and ¼ in. When thickness above ¼ in. is needed, Armorline can be applied, ply by ply, to the required gauge. (356)

• Iowa Manufacturing Company is introducing the Cedarapids Super Commander tandem crushing and screening plant which follows the design of the Cedarapids Commander plant, but incorporates larger components to achieve a capacity of up to 500 t.p.h. of one to four product sizes.

The most important component in the plant is the 12x36 jaw crusher, which is reported to give the plant 40 to 100 percent more primary crushing capacity. The Super Commander has a 48-in. by 14-ft. horizontal triple deck vibrating screen which gives it 40 percent more screening capacity than the Commander. The elevating return wheel is 12 in. larger in diameter and 5 in. wider and the conveyors are 36 in., or 6 in. wider, to handle the greater circulating load.

The plant can be fed by a plant mounted feeder and hopper or by a ground level feeder and hopper driven by a swivel drive. Other design features include simplified drives, new belt wipers, and an optional 48-in. by 10-ft. pre-screening attachment that allows the plant to produce 100 percent crushed material. The plant can also be fitted with a spray bar washing attachment to produce washed aggregate and a 12-in. diameter by 4 ft. 6 in. long sand ejector screw to handle wet or dry sand. (357)



RotoPamic air cleaner for diesel, gasoline, and LP engines.

• The RotoPamic air cleaner, developed by the Farr Company, cleans intake air for diesel, gasoline, and LP engines with an efficiency which is reported to exceed 99 percent, while at the same time reducing maintenance costs and downtime.

The RotoPamic is a two-stage filter, combining a centrifugal separator with a special paper aftercleaner. The first stage spins out coarser dust and dirt. Bleed air and exhaust gases automatically clear this dirt out through a special aspirator on the exhaust stack. The second stage traps the finest particles. Only service necessary is changing the Pamic aftercleaner cartridge. Each new Pamic cartridge has its own absolute air seal which is automatically renewed at each service. This cartridge, removed and replaced from the dirty side of the cleaner, eliminates engine contamination during service.

Failure to service results in decreased horsepower rather than damage to engines. The engine is fully protected at all times.

RotoPamic housing fits under the hood line of most equipment. **(358)**

• A combination timing belt and V-belt permitting the transmission of power with both sides of the belt has been introduced by United States Rubber Company.

While the theory of dual power transmission belting is not new, the manufacturer reports this is the first type of double-duty belting that enables users to take advantage of a positive drive, non-slip timing belt that requires no lubrication.

T-V-belts are of integral construction with the V-belt side of the dual belt notched for greater flexibility, which, the manufacturer reports, permits pulley diameters as small as half-an-inch at 10,000 r.p.m.

These new T-V-belts are currently being manufactured by U. S. Rubber in standard ⅜- and ½-in. pitches for light and heavy-duty applications. Three other standard timing belt pitches—⅕ in. for extra-light duty, ⅞ in. for extra-heavy duty, and 1¼ in. for double extra-heavy-duty—will be added. **(359)**

Wherever Ore Moves, SCOOT-CRETE
Ore Carriers Move It • FASTER • EASIER • AT LOWER COST

SCOOT-CRETE CD-4, shown being loaded in mine, will carry up to 15 tons payload. Model CD-3N has 5-ton payload. Note driver's side-mounted position for maximum vision and efficiency, forward and rear.

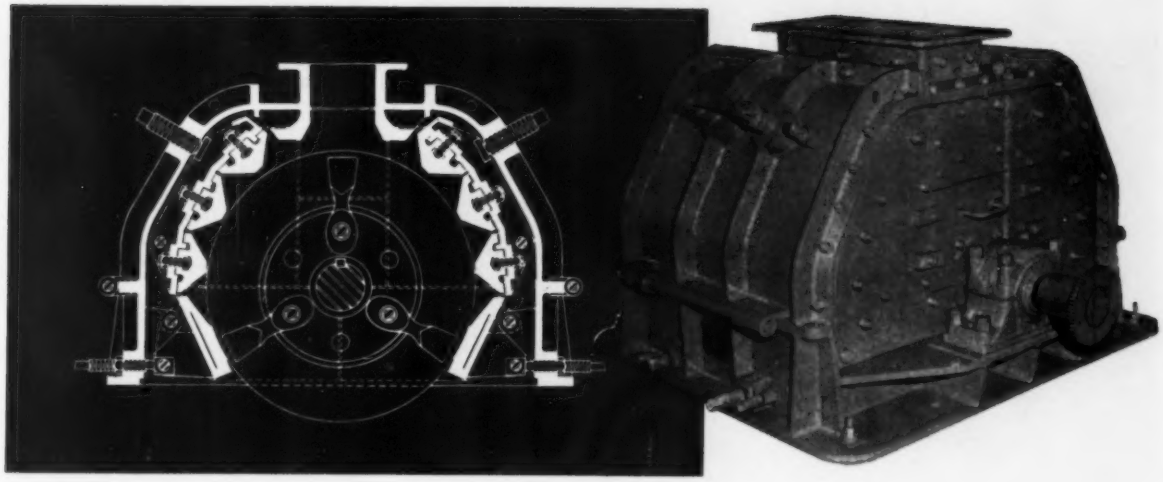
On the Western Slope, on the Colorado Plateau, SCOOT-CRETE does the job. No rails needed, no ties, no cars, no independent power source. Diesel-powered for operation inside the mine, SCOOT-CRETE carriers are rugged for around-the-clock service, carry up to 15 tons at speeds to 15 mph, climb grades up to 18%. All CD models approved by U.S. Bureau of Mines for underground mining.

Units available from 3,000 lb. to 15-ton capacity. Write for specifications and literature. See your Dealer. **GETMAN BROTHERS** SOUTH HAVEN, ZONE 6, MICHIGAN

Enter 62 on card, page 155

• The Model W-10, newest addition to the J. I. Case Terraload'r line, is a four-wheel drive, rear-wheel steer tractor-shovel with a carry capacity of 6,500 lb. at 4 m.p.h. Standard bucket size is 2 cu. yd., SAE rated, with a 1¼-cu. yd. heavy-duty bucket, and a 2⅞-cu. yd. light materials bucket optional. Lift capacity at 0 m.p.h. is 13,000 lb.

Outstanding feature of the W-10 is its power-to-weight ratio. The addition of torque converter drive enables the unit to develop great push-power with a minimum of wheel slippage. The rear wheels



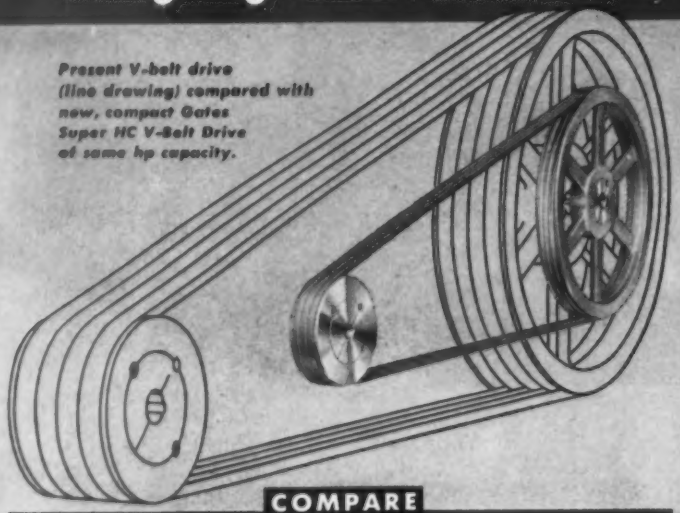
SUCH COMPLETE ADJUSTABILITY HAS NEVER BEFORE BEEN AVAILABLE IN A CRUSHER

Pictured above is one of several types of Pennsylvania Reversible Impactors. The breaker block areas on both sides of the mill are adjustable, permitting the operator to move the blocks towards, or away from, the hammer circle. The upper blocks on each side of the rotor can be adjusted independently of the lower blocks, and vice versa. This complete adjustability gives you option of product size, within a reasonable range, and assures uniformity and constant tonnage of product during the entire life of the hammers and blocks—a money saving feature that is very desirable. For complete information on the entire line of Pennsylvania Reversible Impactors, send for bulletin 6018. Pennsylvania Crusher Division, Bath Iron Works Corporation, West Chester, Pennsylvania.

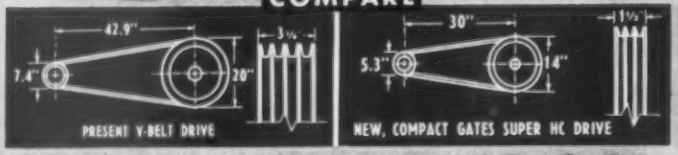
Pennsylvania CRUSHERS

Designing NEW DRIVES?

Present V-belt drive (line drawing) compared with new, compact Gates Super HC V-Belt Drive of same hp capacity.



COMPARE



Save up to 20%

with new high capacity V-belt drive

When you change the whole drive — both V-belts and sheaves — remember: The cost of a Gates Super HC V-Belt Drive is as much as 20% less than the cost of present V-belt drives of the same horsepower capacity.

A development of Specialized Research in the world's largest V-belt laboratories at Gates, the new Super HC V-Belt makes possible the most compact, lightest-weight, lowest-cost multiple V-belt drive you can put on any machine!

Cuts drive space as much as 50%

With Gates new Super HC V-Belt, sheave diameters and widths can be reduced 30% to 50%, center distances 20% and more. Bearing load is lightened and total space occupied by the drive may be cut as much as 50%.

"The Modern Way to Design Multiple V-Belt Drives" is an informative handbook on the Super HC Drive, available from your nearby Gates Distributor listed in the Yellow Pages of your phone book.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.
World's Largest Maker of V-Belts

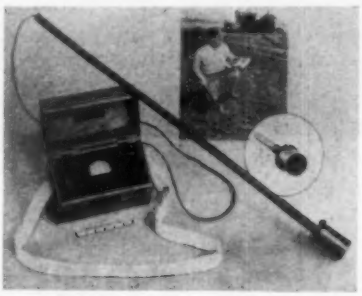
TPA 439

Gates SUPER HC V-BELT Drives

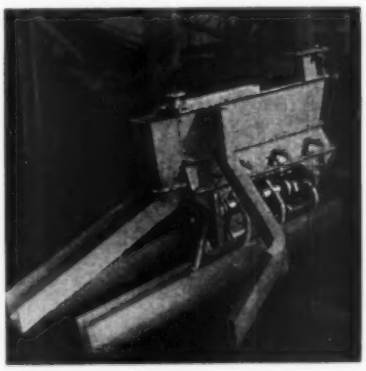
Enter 64 on card, page 155

carry over 40 percent more empty weight than the front wheels, providing greater digging traction with less bucking, as well as greater stability.

Full power steering and powershift transmission are standard equipment on the W-10. A new shift linkage enables the operator to work in low gear, then reverse direction and shift to a higher gear with a single hand motion. **(360)**



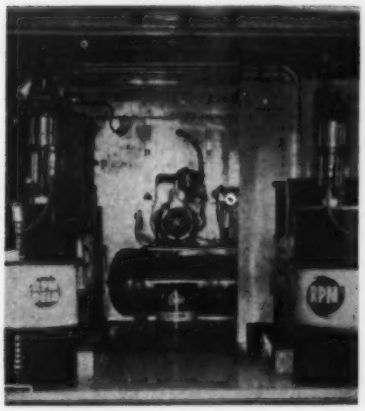
• Exact moisture content of surface or sub-surface sand, soil, or any bulk material can be measured instantly by this portable moisture meter available from C&W Sales Company. Moisture content registers on the dial when the probe, connected by cord to the meter, is plunged into the material. **(361)**



• A pilot-size version of its Remer-Jig, incorporating all of the characteristics of the larger models, is available from WEMCO, a Division of Western Machinery Company. The 1- by 3½-ft. bed has a capacity of 1 to 3 t.p.h.

This pilot-size jig features the same double-stroke jigging action that is found on standard Remer-Jigs. It combines the speed and length of the conventional jig stroke with a separate high frequency pulsation to create greater uniformity

of jigging action, better stratification, accelerated settling of fines, and greater capacity per foot of bed. (362)



• Portable lubrication rigs, which can be designed and installed on small pick-up, large flat bed, or enclosed van-type trucks, are available from The Cypher Company in standard and custom-built models.

A portable lubrication rig is equipped, generally, with an air compressor and six air-operated drum pumps, 400 lb. or 200 lb., two for high pressure operations and four for low pressure jobs. These pumps are attached to either 55-gal. drums or fabricated tanks. A bank of spring loaded hose reels, equipped with 35 ft. of flexible hose, will allow the operator to handle any job outside of the rig. In most cases these rigs are equipped to dispense motor oils, gear oils, and light or heavy grease for chassis and track roller lubrication. If so desired, units for gasoline, diesel fuel, water, and air can also be installed in the rig. (363)

• The Formsprag Company, manufacturer of over-running clutches. and national sales agent for the Rawson Clutch-Coupling Division of O. S. Walker Company, Inc., is marketing an improved version of the Rawson centrifugal clutch.

Formsprag reports the 100 percent metallic shoes in the new Rawson models are molded from a copper matrix material which dissipates friction heat and reduces surface wear of the shoes.

Four models and nine sizes are available, both as a clutch and as a

Improved Gates Vulco Rope gives you 2 important advantages

1. 40% higher hp rating at no increase in price: This important cost-saving advance is the result of Specialized Research in the world's largest belt-testing laboratories at Gates. **As replacements on standard drives these V-belts with 40% more load-carrying ability give longer service life...reduce down-time, cut belt replacement costs.**

2. Concave Sides (U. S. Pat. 1813698): The sides of Gates Belts are concave (Fig. 1). When the belt is bent around the sheave, the concave sides fill out—become straight—for full, uniform contact with the sides of the sheave groove (Fig. 2). Uniform contact insures maximum pulling power...even distribution of wear...longer life.

Fig. 1

Fig. 2

Available in all sizes from your nearby Gates V-Belt Distributor listed in the Yellow Pages of your phone book.

When designing new drives
use Gates new Super HC V-Belts and Sheaves.
See opposite page.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.

World's Largest Maker of V-Belts

Gates

TPA 432

Gates Hi-Power VULCO ROPE V-Belts

Enter 65 on card, page 155

Indiana limestone, "the nation's building stone," in the heart of the world's largest stone belt. Limestone a la carte is served in tremendous volume by the Empire Stone Company, Bloomington, Indiana, where Gulf lubricants keep all equipment running smoothly. In foreground, channeling machines are slicing the stone into blocks.

Empire Stone Company protects all equipment at 4 quarries

GULF MAKES THINGS

"We operate nearly 100 pieces of heavy equipment. But with the help of our Gulf Sales Engineer, we've set up a lubrication program that protects all these units with only 4 Gulf lubricants. This simplifies storage and inventory. More important—we've never had any machine downtime traceable to lubrication."

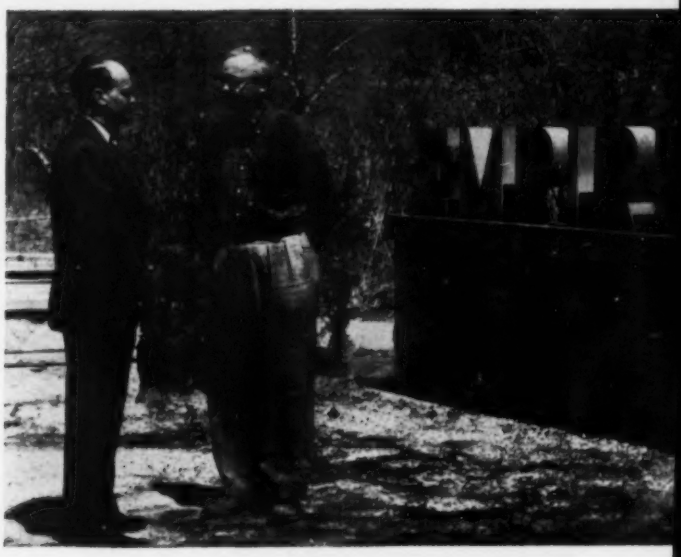
That's the word from Mr. Norris Chumley, President of Empire Stone Company, Bloomington, Indiana. Empire, a leading producer of building stone, operates 4 busy quarries in the heart of the Indiana limestone belt.

Their equipment includes 3 dozers, a power shovel, 2 dumpsters, 8 dump trucks, 6 air compressors, a dozen 30-ton hoists, a 25-ton traveling crane, 10 gang saws, diamond saws, splitters and 18 channeling machines.

Gulf Harmony oil is used in all their hydraulically operated equipment (such as the splitters, and the hydraulic controls on the dozers), for the electric motors of their channeling machines, gang and diamond saws, and in the valves of their air compressors.

Gulf Multi-Purpose Gear Lubricant is used in the gears of the channeling machines and the traveling crane. All dump truck engines are lubricated with Gulflube Motor Oil H.D. Track rollers on the dozers are greased with Gulf Track Roller Grease A-C.

Tireless workhorses at Empire Stone Company are the dozers that strip the overburden. Track rollers on all their dozers are greased every 1,000 hours with Gulf Track Roller Grease A-C . . . a lubricant specifically developed for this use.



Gulf man on the job checks lubricant needs at Empire Stone. Left, Marshall S. Ringo, Gulf Sales Representative, with Norris Chumley, President of Empire Stone Company.

with 2 Gulf oils, 2 Gulf greases . . .

RUN BETTER!

"Most of our equipment operates in the open air, exposed to limestone dust and moisture," says Russell Eads, Company Superintendent. "So we use the best lubricants available, and make sure they're changed at the proper time. This policy has paid off for us in keeping equipment downtime to a minimum."

Your quarry equipment will run better when you switch to clean-working Gulf lubricants. Try them and see for yourself. For more information, just call a Gulf Sales Engineer at your nearest Gulf office. Meanwhile, mail coupon for "Gulf Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send latest edition of "Gulf Contractors' Guide."

Name_____

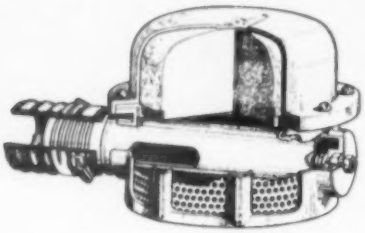
Title_____

Company_____

Address_____

City_____ Zone_____ State_____

clutch-coupling. Rawson clutches are commonly employed to obtain smooth starts without slip and for controlled acceleration of high inertia loads on such machinery as crushers, pulverizers, conveyors, etc. They are also installed for torque-limiting, or over-load protection purposes. (364)



• Designed for use with pumps in de-watering operations, the Dolphin floating suction strainer, manufactured by Megator Pumps & Compressors, Inc., permits drawing water from just below the surface to avoid taking in sand or silt from the bottom or floating matter from the surface.

The Dolphin strainer prevents the formation of vortexes because of the cylindrical disposition of the center holes and because any tendency to vortex formation is automatically countered by a slight sinking of the strainer so that a vortex-free position of equilibrium is established.

Any tendency of the twisting action of the hose to turn the strainer out of its correct position or to invert it is overcome by correct analysis of the balance and buoyancy of the parts and because the tube to which the hose is directly attached can rotate freely in the body of the strainer.

The float chamber is filled with a moulding of expanded polystrene foam, which provides millions of separate water-tight air cells so that buoyancy cannot be lost as a result of accidental damage.

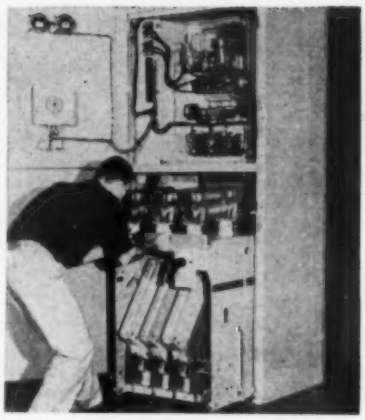
Because the bottom of the strainer is flat and all the entry holes are in the sides, the Dolphin still tends to keep its upright position when in water too shallow for floating. There is no tendency for the extremely light strainer to sink or be sucked down into the sand or silt on which it may be resting.

The strainer is made in four sizes, for 1¼-, 2-, 3-, and 4-in. hoses. (365)

• A completely redesigned medium voltage a.c. motor starter of special significance to the cement and aggregate industries has been introduced by the General Electric Company. Called Limitamp Control, the controller features new draw-out contactor and fuse-shelf assembly. It is designed to provide short circuit protection and co-ordinated control for squirrel-cage, synchronous, and wound-rotor motors up to 3,000 hp. rated from 2,300 to 4,600 v.

Applications in the cement and aggregates industries include medium-voltage motors driving heavy production equipment such as crushers, grinders, compressors, hammer mills, and ball mills. For ball mill applications, spotting equipment can be provided with the new Limitamp panels so that mills can be conveniently stopped at the best positions for reloading or inspection.

Key to maintenance of the starter is the draw-out, plug-in contactor and fuse assembly shown in the above illustration being removed from the unit. All hardware is captive and a magnet-head wrench which fits all bolts is included with the starter.



A built-in test circuit permits the controller to be operated and checked while isolated from the normal power supply.

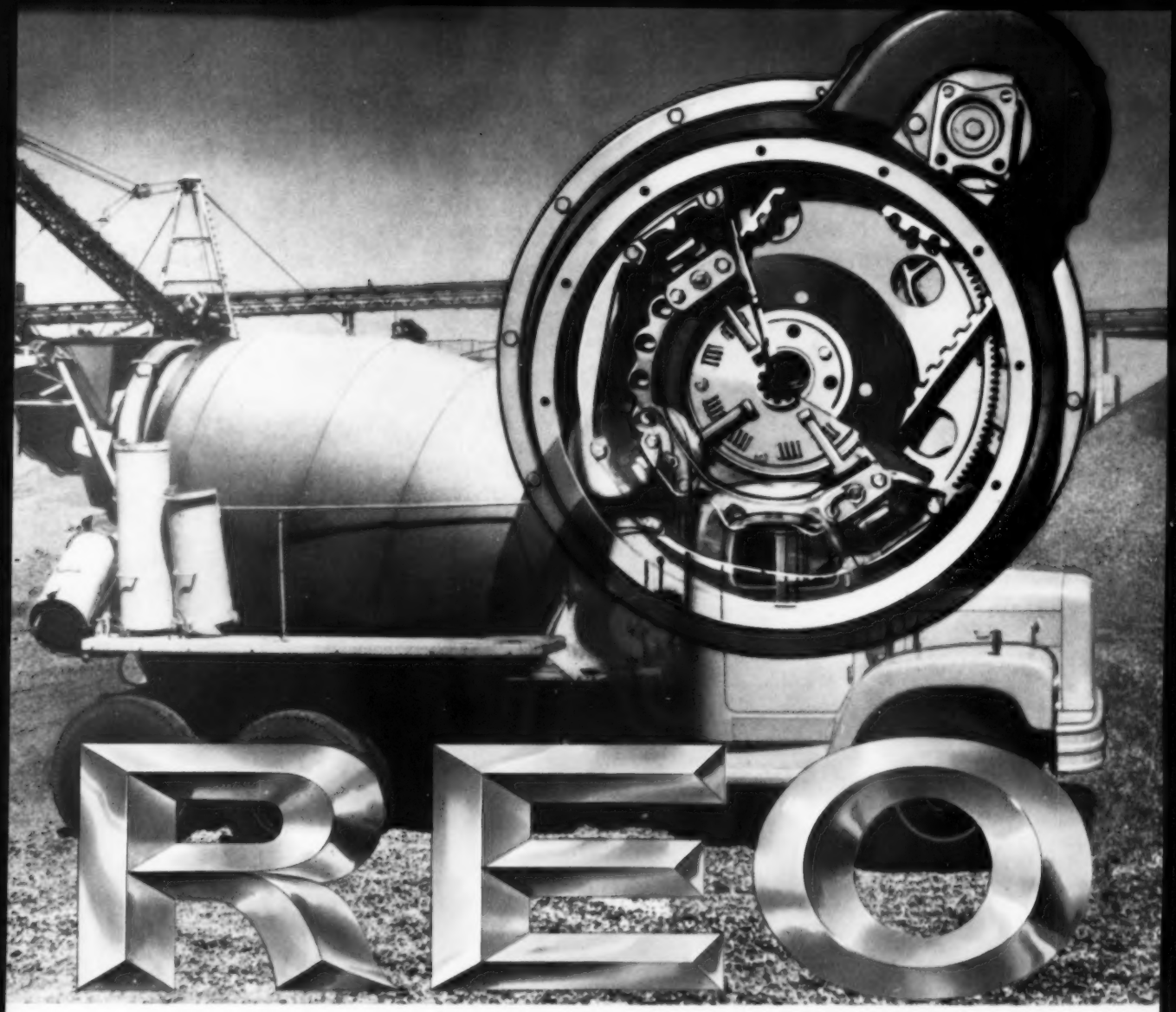
All high-voltage components are automatically disconnected and isolated from incoming line and bus before the enclosure can be entered. All high-voltage compartments are isolated by metal barriers. (366)

• Supplied by Sprout, Waldron & Company, Inc., this bulk cement handling truck is in use at the Dover Sand and Gravel Company, Dover, Del., where it is reported to unload 13½ tons of cement in less than 20 minutes.

This unit has a 367 cu. ft. cement unloading body, constructed of 12-gauge steel. The tank is divided into two compartments, with two 24-by 24-in. inlet doors in each compartment.

A 9-in. screw conveyor which runs the length of the body conveys the material to the rear of the truck. In this design, the cement or sand being handled dumps directly from the screw conveyor into a ground level hopper. (367)

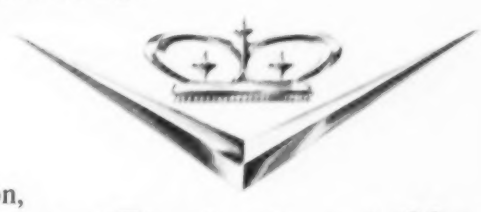
Enter 69 on card, page 155 →



Reo's revolutionary new Flywheel P.T.O. brings to transit mix operators a "*bonus*" *payload increase from 400 to 600 lbs. per trip*— actual weight savings in a 6½ cu. yd. mixer unit resulting from the elimination of separate engine power. Also eliminated are the headaches of separate service and maintenance requirements.

Reo engineered and installed as an integral part of the chassis engine drive, the Reo Flywheel P.T.O. supplies the mixer with a lighter and more efficient new source of power—smooth . . . even flowing . . . direct.

Most important, operators can have the "bonus" payload advantage of Reo's new P.T.O. at a low initial cost of equipment. Now available in Reo's rugged "C" Series line of transit-mix trucks. Another product of Reo's creative engineering skill has been added to the many important values found only in Reo Trucks. Reo Division, The White Motor Company, Lansing, Michigan.



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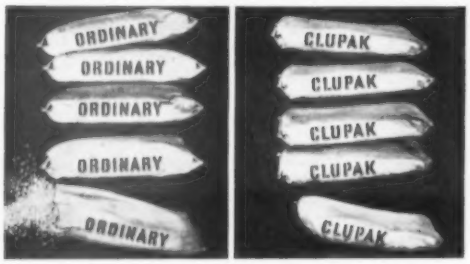
Cotton seed meal	Salt
Dehydrated alfalfa	Sand
Feed	Seed
Flour	Soybeans and meal
Fertilizer	Steric acid
Frits	Sugar
Hydrated lime	Sulphate of potash
Meal	Talc
Oyster shells	



DROP TEST comparison demonstrates CLUPAK paper's ability to resist shock. Multiwall sack made with CLUPAK paper (right), survives many more test falls than sack (left) made with ordinary kraft.

ROUGH HANDLING in shipping emphasizes CLUPAK kraft's toughness, ability to stand up where failure often occurs with ordinary multiwalls. Even when new, lighter bag constructions are used, the CLUPAK trademark is your assurance the bag paper meets the most rigid of shipping requirements.

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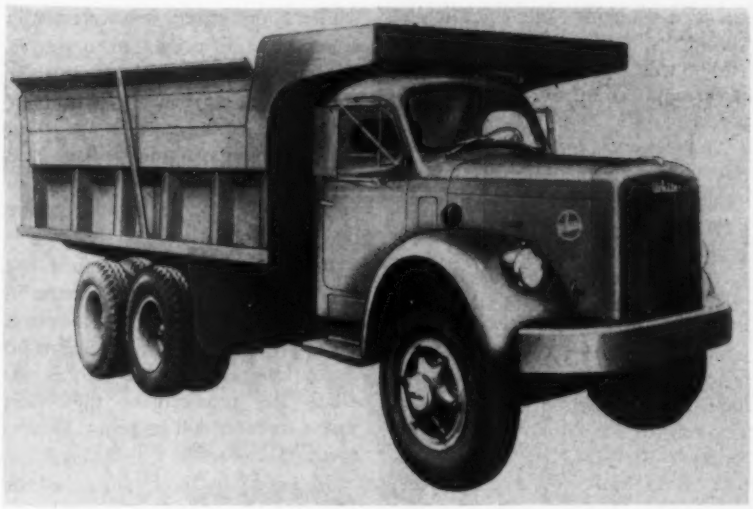
Continental Can Company, Inc.	Union Bag-Camp Paper Corp.
Dynas Aktiebolag (Sweden)	West Virginia Pulp and Paper Co.



● A new line of White tandem-axle trucks for ready mixed concrete and materials hauling operations is available from The White Motor Company. The trucks are for use with dump bodies, dump trailers, concrete mixers, flatbed bodies, and other specialized operations. Four model designations from 35,000 to 75,000 lb. g.v.w. are offered with a range of component options which permits tailoring the chassis, engine, transmission, and axle combinations of each model to the requirements of the operator.

Model designations are the medium-weight 2064 (illustrated), which can be engineered for g.v.w. of 35,000-40,000 lb.; the 4264, for 40,000-75,000 lb. g.v.w. and 5 to 10-cu. yd. mixer capacities; the 4464D, for 43,00-75,000 lb. g.v.w. and 6- to 9½-cu. yd. mixer payloads; and the 9064, a 90-in. bumper-to-back-of-cab truck for 45,000-75,000 lb. g.v.w. and mixer capacities of 5½ to 10 cu. yd.

The 4464D utilizes a White diesel engine; the other models, White Mustang gasoline engines ranging from 145 hp. to 215 hp.

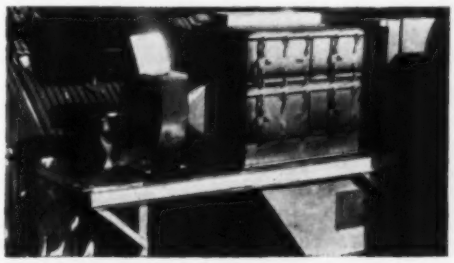
The wide-tread front axle feature permits shorter turning radii and, combined with other features, allows more chassis and payload weight shifted from rear to front axle. The frames are double-channel with local third channel for some applications.

Tandem rear axles are available in single reduction, double reduction hypoid, and double reduction planetary differentials with applicable axle ratios and choice of suspension. Front axle options also are available.

The standard transmission of the new models is five-speed main with three-speed auxiliary. A complete range of five-speed transmissions and auxiliaries may be obtained. For power take-off applications, all models have adequate capacity for front engine drive, SAE side mount, extended counter loft, or mid-ship auxiliary and power tower installation. (368)

● Dayton Industrial Products Company, a division of the Dayton Rubber Company, has a new line of poly-V drives fabricated to provide resistance to oil, heat, and static. Designed with a series of parallel V-ribs molded on the inside circumference, these V-ribs completely fill the sheave V-grooves in which they operate. The manufacturer reports this construction takes advantage of the greater area of contact and the hydrostatic principle of incompressibility, which results in its ability to transmit greater loads more efficiently. Other features include greater flexibility which permits use of smaller diameter sheaves.

Dayton poly-V-belts and sheaves are available in three V-rib sections: "J" (3/32 in.), "L" (3/16 in.), and "M" (3/8 in.), and in a complete range and number of V-ribs per belt. (369)



Barely visible discharge from exhauster in this unretouched photo shows how Dustex Miniature Cyclone Collector ended a problem for Perlite Products Co.—while recovering 70 lbs./hr. with no maintenance.

"95% PREDICTED EFFICIENCY PROVED . . .

and Collector is maintenance-free!" . . . at Perlite Products Company

Frank W. Shaffer, President of Perlite Products Co., Primos, Pa., writes this about his Dustex Miniature Cyclone Collector purchased on a basis of the Dustex Single Tube Determination test:

"Your predicted efficiencies of 95% are proven . . . collecting 70 lbs./hr. of 85% below-325-mesh material at 450°F . . . complaints on discharge are ended, and the collector is maintenance-free."

Write Today for Dustex Bulletin "A Simplified Test Method" describing actual collection test at your plant at no obligation.

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Enter 71 on card, page 155

Washington News Letter

(*From page 11*)

unions ask. Hence, in Professor Slichter's view, wages will continue to outrun output per hour.

Professor Reynolds is a little more optimistic about the possibility of solving the problem. In his view, output must rise sufficiently to offset the rate of wage increases. If the output should rise by the same rate as wages, prices would not be able to increase. He also thinks that public understanding might help. Finally, he makes four suggestions:

1. Improving labor markets and labor mobility so that pockets of labor shortages will not develop in which wages are rapidly bid up.
2. Strengthen competitive forces in product markets and discourage price agreements.
3. Build lags into wage adjustments.
4. Strengthen employer solidarity in collective bargaining.

He does not explain how each of these objectives would be accomplished. The recent actions of the steel companies would appear to meet his requirement perfectly.

Labor Developments

(*From page 13*)

number of workers involved is too small. This change affects relatively small businesses only.

If he is to be helped, when faced with a demand for recognition—often by the Teamsters Union—the operator of a small business will have to take his case courageously to the state agency, rather than sign up. In the meantime, he can count on a picket line around his place of business and will have to assume all the risks involved in a labor dispute. How many more small businessmen will do this, now that they can take their problems to a state agency, is problematical.

On the picketing problem, the new law might do such an employer, as well as other employers, some good. It limits picketing before a representation election to a reasonable time not to exceed 30 days. After such an election has been held, no further picketing is permitted for a year.

The unions have opposed these provisions on the ground that it makes organizing more difficult. Although this is probably so, it certainly introduces rules which appear to be required on the sheer ground of fair play.

At the same time, organizational picketing is also outlawed if the employer has recognized another union. While this provision looked like a good idea, now that it has been passed there is some concern, even in employer circles, that this may, unwittingly, have given unscrupulous employers and unions undeserved legal protection. It gives equal protection from nuisance picketing to the employer who has conscientiously recognized a legitimate union desired by his employees and to the employer who has recognized a union controlled by racketeers who, for a consideration, will deliver an otherwise inexpensive "sweetheart" contract. Such an employer is a truly unfair competitor.

A good deal of the fire raged around the question of finally outlawing secondary boycotts. The Taft-Hartley law tried to do this over a decade ago, but through imperfect draftsmanship and judicial interpretation it ended far from the mark. One of the loopholes of that law, which the new one closes, is that so-called "hot cargo" clauses are made unlawful. This is a clause in a union contract, generally found in Teamster agreements, whereby the employees refuse to handle cargo to or from firms involved in a labor dispute.

Already outlawed is the secondary boycott, whereby a union seeks to induce groups of neutral employees to place pressure on their employer to refuse to do business with a struck firm. The new law broadens this prohibition to include individual employees, as well as groups; but even more important is the fact that unions may no longer try to get neutral employers to discriminate against struck firms. Here, again, although the unions may find the secondary boycott a useful weapon to employ, it is really quite infrequently used. The employer who may prefer not to be involved in doing business with a struck firm may find himself caught by the legal necessity for not discriminating.

The unions can point to only a few minor victories. Formerly workers on strike over economic issues were not permitted to vote in representation elections, while their replacements often voted their union out as the bargaining agent. Now both the striking workers and their replacements will be able to vote for a year after the strike begins.

The new law also legalizes the practice which has always been in effect in the building industry; namely, before a project begins to make labor agreements which include the requirement that only union workers will be hired. Henceforth, this practice will be legal.

Measured by the bitterness of the argument it set off, this legislation would be expected to change labor relations fundamentally. More careful analysis fails to reveal either why this should occur, or where.

Toll Projects Gain Support As Turnpike Profits Mount

After three dreary years, toll road bonds are coming back in style, according to *Business Week*, primarily because of their promising financial return. New investor support is forming now behind major projects because the existing pikes appear to have recovered from their troubles with high costs and disappointing revenues.

Prices of outstanding turnpike issues are rising, and new turnpike projects are hovering on the scene. The end of the recession has also helped boost traffic.

Traffic engineers reportedly do not believe the boom will be as great as the 1953 one. The emphasis will be on construction of local expressways that bypass large cities or connect them with the mushrooming suburbs, but it will probably be a modest program due to the high cost of urban building.

A 150 t.p.h. sand and gravel company was recently put into operation on the Lehigh River in Palmer Township, Pa., by Lehigh Valley Sand and Gravel Company. The plant was built by the Aggregate Equipment Company of Lancaster, Pa., on a 40-acre site.

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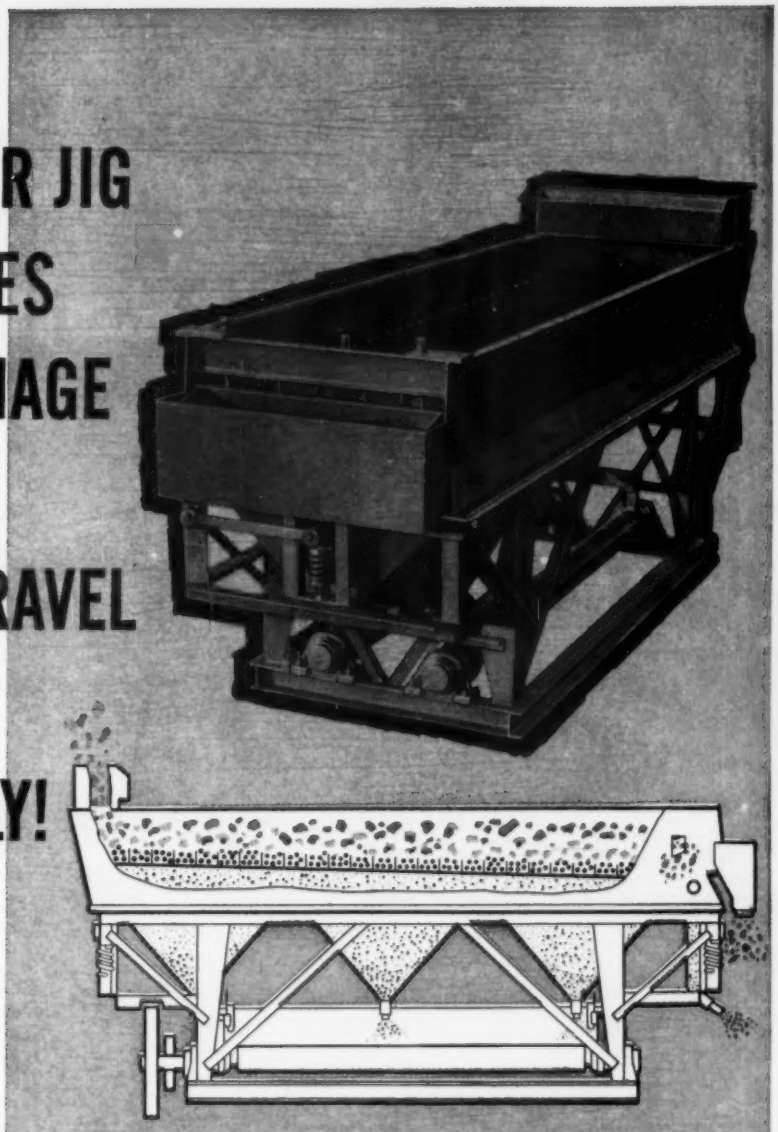
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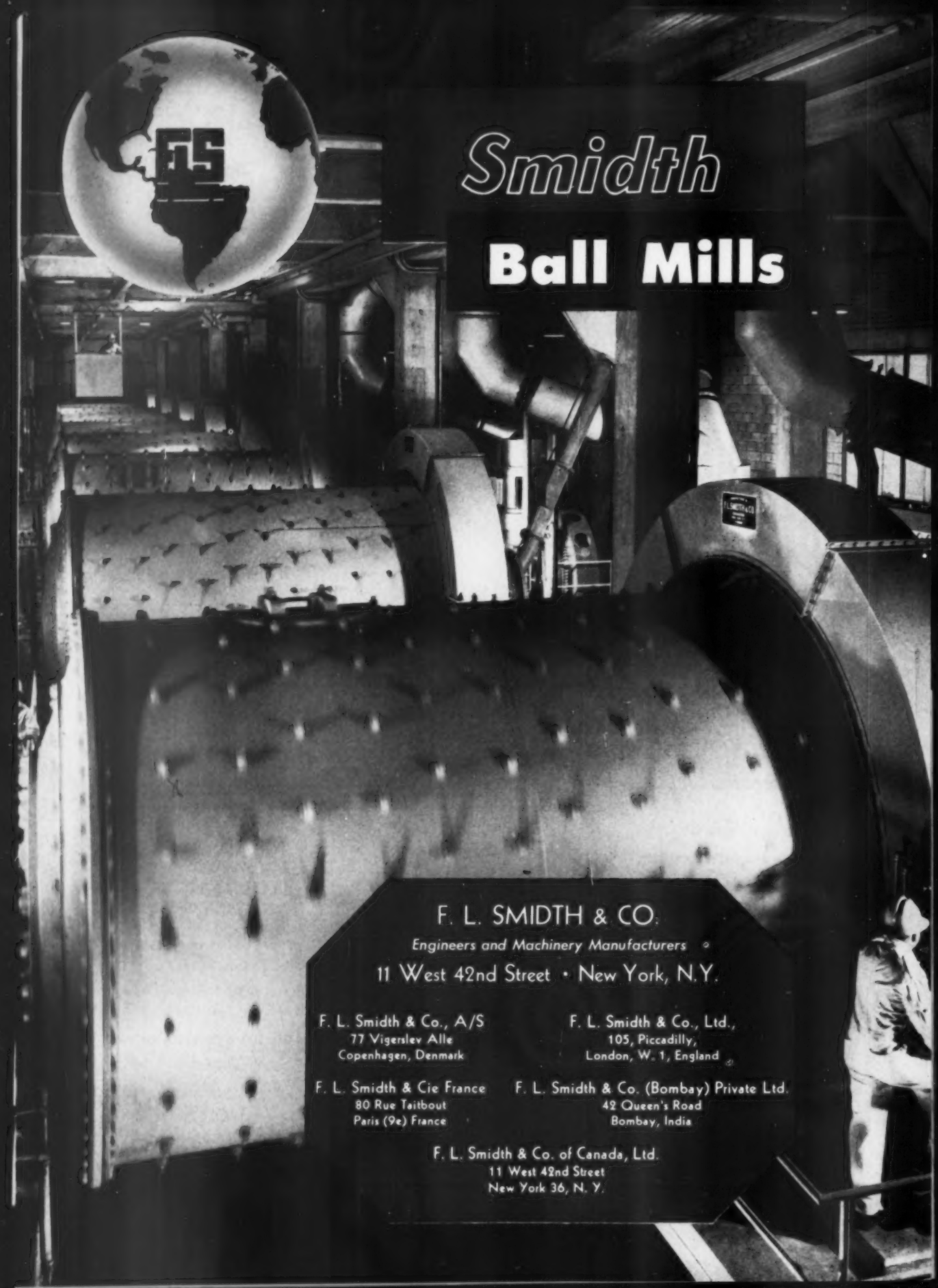
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The Editor's Page

Highway Funds Are Adequate— If Used for Highways

IN THE closing days of this session of Congress there was the usual rush to push through important legislation. One of the last to become law was the amended Federal Aid Highway Act of 1959. This Act provides for a 1-cent per gallon increase in the federal gasoline tax over the next 21 months, which is expected to bring in enough revenue to keep the highway program going, on a somewhat reduced level. On July 1, 1961, when this temporary gax tax increase is to expire, other "temporary" tax funds derived from motorists are to be made available for another three years.

Most of the blame for the shortage of funds, which had already begun to slow down the highway program, has been laid on the ill-advised speed-up of the program authorized by the Federal-Aid Highway Act of 1958. Poor advance planning, increased costs, additions to the program, etc., have also been blamed.

Comparatively little has been said, however, about the extent to which diversion in various forms at both state and national levels has whittled away at available funds. No recent information is available, but diversion is known to have reached a total of $304,966,000 in 1957, a very slight decrease from the record total of $325,300,000 diverted in 1956. That there has been little letdown since 1957 is obvious from the continual stream of information coming in on diversion efforts, some of them successful.

ACCORDING to the American Petroleum Institute, the Federal Government in 1958 collected a total of $3,600,000,000 dollars from its special taxes on motor vehicle ownership and use, but only $2,100,000,000 dollars of this was earmarked for the federal Highway Trust Fund to support the national highway program. The other $1,500,000,000 was channeled to the general treasury for the support of governmental activities totally unrelated to roads. This means that the combined amount of both state and federal highway user tax money being withheld from highways either by earmarking or by diversion is nearly 2 billion dollars yearly.

Raids at the national level seem to have been fairly well blocked. One bill presented before this Congress would have appropriated $37,100,000 for forest highways and $4,000,000 for public land roads from the Highway Trust Fund, instead of from the general fund of the Treasury. This bill was killed on a technicality only.

DIVERSION efforts at the state level have had some success. In North Carolina the state legislature recently passed a law requiring the State Highway Commission to pay half of the cost of maintaining railway grade crossing safety signals. Similar actions in other states have totaled many millions more. In many states which have laws prohibiting diversion, proposals have been made for their repeal, so that gas tax funds could be used for schools, general funds, mass transit subsidies, budget balancing, playgrounds, parking facilities, mental hospitals, etc.

There will be no end to the efforts to divert highway funds for other uses. Only through eternal vigilance and prompt and effective action can such diversion be held down or eliminated. Producers of materials used in highway construction should be especially alert in spotting such efforts at both state and national levels, and should do something about them immediately.

Walter E. Trauffer

AS THE MOST OUTSTANDING PHASE of Medusa's 8-year, $40,000,000 program of plant and product improvement, the Wampum mill is new from the foundations up, replacing its predecessor at this site. Here are the two 12- by 390-ft. kilns.

A New In

ALONG WITH the construction of the new mill, a new quarry was opened. Both shale and limestone are obtained from the workings shown here.

IN THE STRUCTURE right of center are a pair of screens which are closed-circuited with the secondary crusher in the top building.

ANOTHER ON THE SPOT REPORT

A STRIKING new chapter in the nearly century-long record of one of the country's most historic cement producing locations was completed last year when Medusa Portland Cement Co. placed its new Wampum, Pa., plant in production. The latter replaces facilities that Medusa has owned at Wampum since 1929—but with an annual capacity of 2,500,000 bbl. the new mill represents an impressive 100 percent jump in rated production.

As evidence of its belief in future cement markets—or as company literature aptly puts it, the New Era of Concrete—Medusa has spent nearly $40,000,000 in the last eight years to improve plants and products. While the firm's other operations (including subsidiaries) at Toledo, Ohio, Dixon, Ill., Manitowoc, Wis., York, Pa., Bay Bridge, Ohio, and Paris, Ont., all underwent mod-

By BURBN G. HEROD

Medusa builds 2,500,000-bbl. plant to completely replace old mill—outstanding feature in multimillion-dollar company-wide program

Chapter Historic Wampum Operations

ernization projects, the Wampum mill is probably the most outstanding factor in the entire program since it is new from the ground up.

In addition to being the company's newest plant, the Wampum operation provides a sharp contrast to its predecessor at this site. Cement production at the Wampum location dates from 1874. In 1909 the plant which was superseded by the new mill was built by the Crescent Cement Company. The latter was acquired by Medusa in 1929, and through the years it had been expanded to a 5-kiln operation. However, obsolescence and limited capacity brought its half-century of service to a close on May 9, 1958.

The new plant, which, like the old, uses the dry process, was designed by W. R. Bendy. Construction by a contractor was supervised by Medusa's engineering staff. Of all existing facilities, only certain auxiliary buildings, the office building, and the finished product storage silos were incorporated into the new installation, and plans are already on the board for replacing the outdated packhouse.

From the time ground was broken in November, 1956, the program moved with impressive speed. On May 8, 1958, just 16 months from its inception, the plant was placed in full operation. Among the outstanding features in its design and installation are the high degree of automation, top chemical control, independence of milling circuits, raw-materials-handling systems, exceptional dust control, and high-capacity equipment. Major examples of the latter include a pair of 11-ft. 6-in. by 17-ft., 1,250-hp. raw mills, a pair of 13- by 16-ft., 1,500-hp. finish mills, and the two 12- by 390-ft. kilns.

Although the cement mill is obviously the most prominent element in the picture at Wampum, the recently completed program also involved opening a new quarry, plus the construction—at the quarry site — of a 450-t.p.h. crushing-and-screening plant, and a loading station for over-the-road haulage.

Quarry A major consideration in the decision to build the new plant in the same location as the old one was the extensive supply of stone and shale in the Wampum area. Here the Vanport limestone, of Pennsylvania age, averages between 18 and 22 ft. in thickness, and is overlaid by shale which is also recovered for use in the mill. Pea gravel is obtained from a glacial gravel deposit.

The new quarry was opened on the outcrop near the top of a hill above the Beaver River. Stripping —up to 60 ft.—is done under contract, and subsequent blasthole drilling is handled with a pair of wagon drills using 2- and 1¾-in. bits. Air is provided by a pair of pneumatic compressors. Holes are charged with 40 percent dynamite, and the yield has been about four tons of rock per lb. of explosive.

Broken rock is loaded out by a pair of 2½-cu. yd. diesel shovels, and hauled to the primary crushing station by three 15-ton trucks fitted with 12-cu. yd. bodies. As seen in an accompanying photograph, the crusher installation, which is at about the same elevation as the quarry, is approximately 250 ft. higher than the loading station.

Crushing, Screening Rock dumped into the concrete hopper is transferred on a 60-in. apron feeder to the primary crusher. The feeder speed may be varied from

A 450-T.P.H. crushing and screening plant was built at the point where the quarry was opened on an outcrop near the top of a hill.

2 to 9 f.p.m. through a Dynamatic coupling. From the 48X 60, 200-hp. jaw crusher, the material is transferred on a 48-in. vibrating conveyor to the secondary crusher, a 600-hp. impact mill.

The latter is closed-circuited with a pair of 5- by 12-ft. double-deck screens installed in a separate screening tower. Oversize is returned to the impactor in the crusher building, and the 100 percent minus ⅝-in. mill feed is discharged to a conveyor for transport downhill to the loading station. Belt conveyors are used throughout this installation, and the unloading system at the mill, which is described in a later paragraph.

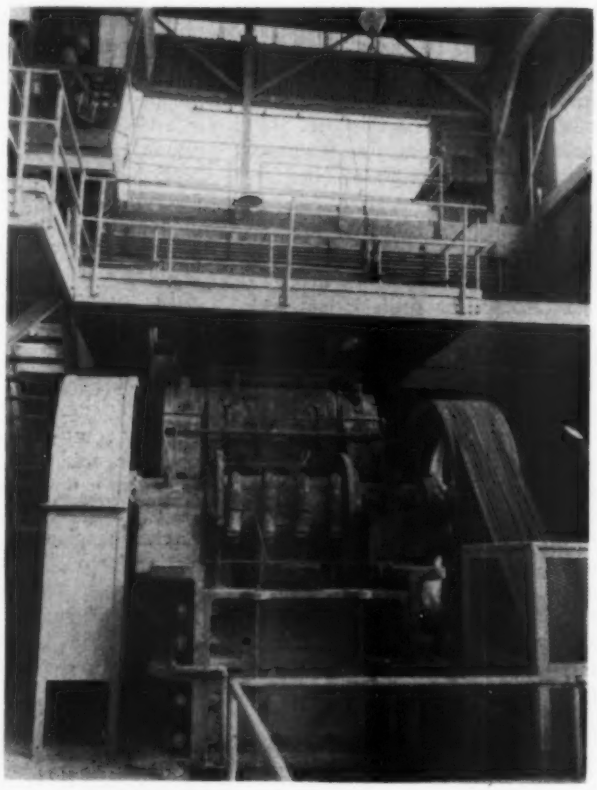
Operations of the crushing and screening stages are controlled from an enclosed booth at the top of the crusher building, and to one side of the primary crusher feeder. From this vantage point, the operator can also visually check on most operations, in addition to referring to the indicator light control panel.

Complete dust control has been provided in the crushing plant by the installation of a Chem-Jet system. Points of application of the system, which was specifically designed for this plant, include the truck dump hopper, the discharge point of the apron feeder, the primary crusher discharge point, and the mouth and discharge of the impactor.

In each case the spray jets are regulated by a flow controller. Those for the dump hopper and the primary crusher discharge are actuated by pushbutton. That on the feeder discharge is also pushbutton-controlled, but in addition it is interlocked with the feeder motor, thus automatically cutting the spray, should the feeder stop. An automatic spray control mounted below the feed end of the conveyor receiving the impactor discharge is actuated by a fraction of an inch in belt deflection, due to load. This turns the sprays on or off in accordance with a loaded or empty belt.

The system, involving a 1¼-in. liquid proportioner, a turbine pump, and a 5-hp. motor, automatically dilutes compound MR concentrate in the ratio of one part compound to 750 parts water for application. The entire installation is also winterized with a hot water tracing system.

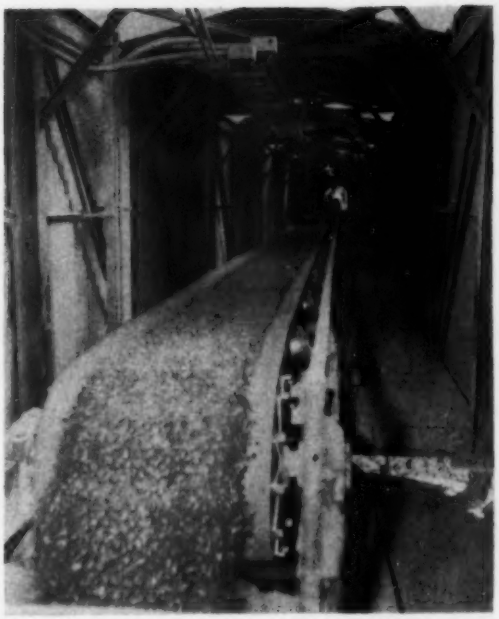
Sized material, either limestone or shale, is carried on the 30-in. by 580-ft. conveyor leading to the loading station at 450 t.p.h., or 340 f.p.m. A 900-ton capacity concrete silo with a truck drive-through accommodates the stone, and an adjacent 150-ton steel tank is used for the shale. Each is equipped with



THE PRIMARY JAW CRUSHER. Visible at the upper left is the enclosed operator's control booth. In addition to having an indicator light panel available, the operator can visually check most operations in the crushing plant from this station.

two electrically operated clam-type draw gates.

A fleet of eight tractor-trailer units is used to haul these raw materials to the mill—a distance of 2½ miles. All pull 20-ton tandem axle bottom-dump trailers, and require only 20 minutes per round trip.



MINUS ⅝-IN. mill feed being conveyed downhill from the screening tower, and discharging into storage at the loading station.

Material Handling At the plant site two parallel unloading systems were installed — one to handle incoming pea gravel, coal, and gypsum, and the other for limestone and shale. The feed hopper of the former can accommodate either rail cars or trucks, but that of the latter is presently set up to handle trucks alone. An operator's booth between the two hoppers houses a control panel for the interlocked feeding and conveying systems that deliver the materials to storage silos.

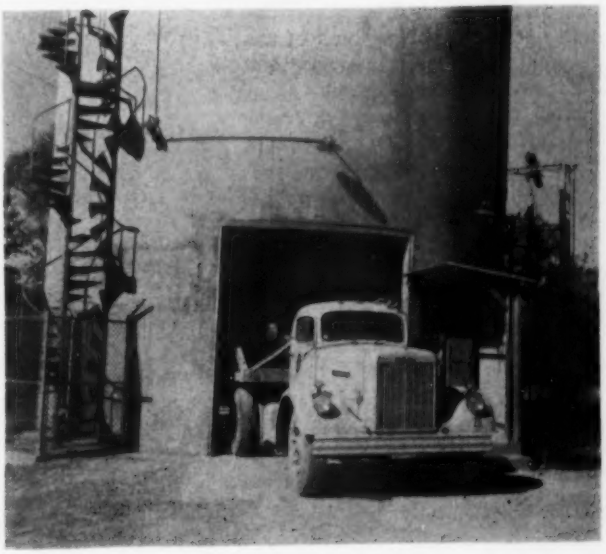
As received from the quarry, stone and shale are dumped on a heavy bar steel grate above the appropriate hopper, and are then transferred on a 48- by 72-in. vibrating feeder to a conveyor (30 in. by 526 ft.) on which they are transported to a turnhead above the silos. The other three materials discharged into their receiving hopper are transferred on a 36- by 84-in. feeder to the other plant feed belt, a 24-in. by 537-ft. unit.

In the gypsum, coal and pea gravel system, a hammermill is installed between the feeder and the conveyor. It is equipped with a bypass spout and a diverting gate, and is used only to crush incoming coal. The two systems may be operated simultaneously or independently and can handle materials at the following rates: 450 t.p.h. of limestone or shale, 250 t.p.h. of pea gravel, 245 t.p.h. of gypsum, and 135 t.p.h. of coal. Only 2-3 minutes are required to empty a hopper.

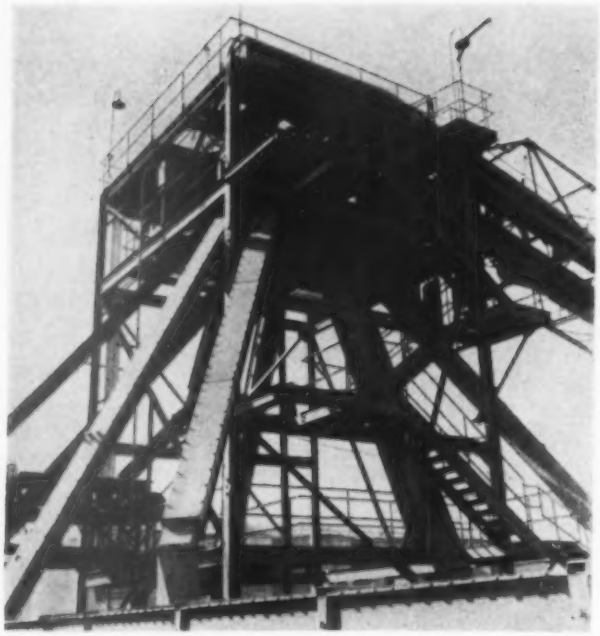
Turnheads at the head ends of the raw material conveyors, controlled from the unloading station, deliver the respective materials to spouts leading to the 12 concrete silos. These are 30 ft. in diameter, 50 ft. high, and are grouped in four rows of three. Four silos are used for stone, another for clinker, two for gypsum, and one apiece for gravel and shale. All are equipped with Bindicators.

In constructing the silos, elevated conical bottoms were made by spraying concrete against an outside form. A natural-frequency conveyor is installed below each of the four rows of silos—two rows of which are assigned to raw mill feed and the other two for the finish mill circuits. The respective materials for the raw mill feed are drawn by constant-weight feeders which are rated at 90 t.p.h. on limestone, 7.2 t.p.h. on shale, and 9 t.p.h. on gravel.

Proportioning of the materials is controlled by "chemist's panels" located in the laboratory. An accompanying photograph shows one of these panels, which was temporarily installed below the raw mill feed silos during the plant break-in period. Once the correct propor-



A FLEET of eight 20-ton tractor-trailer units hauls raw materials from the loading station to the mill. The 5-mile round trip requires only 20 minutes.



RAW MATERIALS discharged from the plant feed conveyors pass through turnheads and chutes to the appropriate storage in 12 underlying concrete silos.

tions have been determined, and are set on the panel controls, the feed composition remains the same until the chemist makes a correction. The mill operator can regulate the rate of mill feed, but not the composition.

Milling Department Raw and finish milling circuits are combined in a single department, with each circuit as an independent system. The material silos are so arranged that each mill is fed from a separate row, with the exception that the shale and gravel drawpoints have cross-over conveyors to permit supplying both of the raw mill lines from the single silos used for those materials.

Each raw mill circuit is comprised of a bucket elevator; a 16-ft. single whizzer separator; an 11-ft. 6-in. by 17-ft. ball mill rated at 56.8 t.p.h.; an Airslide (mill to separator elevator); an automatic bag-type dust collector rated at 21,600 c.f.m.; and a 9-in. pump, plus a rotary compressor, and 8-in. transport lines.

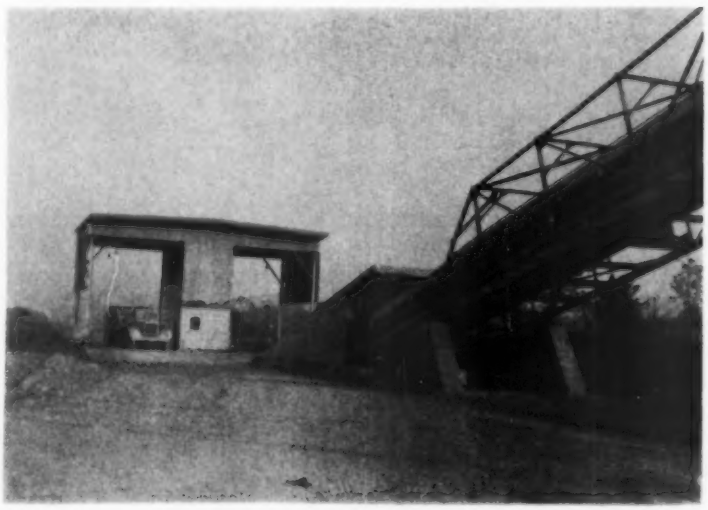
The finish mill circuits include identical bucket elevators and separators, 13- by 16-ft. mills rated at 190 bbl./hr., Airslides, compressors, 6-in. cement pumps and transport lines, and collectors rated at 22,400 c.f.m.

In the raw mill flow, feed is discharged from the conveyors to the bucket elevators in which it is raised to the separators. Moisture is removed before milling by hot air provided for the separators by a pair of 10,000 B.t.u./hr. furnaces fired by stokers. Oversize from the separators enters the respective raw mill—each being charged with 170,000 lb. of 1½- to 3-in. grinding balls. Mill discharge is transferred *via* Airslides to the bucket elevators in closing the circuit. The circulating load is about 300 percent, and the discharge averages 90-92 percent minus 200 mesh.

The finish mills, charged with 200,000 lb. of 1- to 3-in. grinding balls, have circulating loads of 250-300 percent. Atmospheric air is circulated through the separators in these circuits for cement cooling.

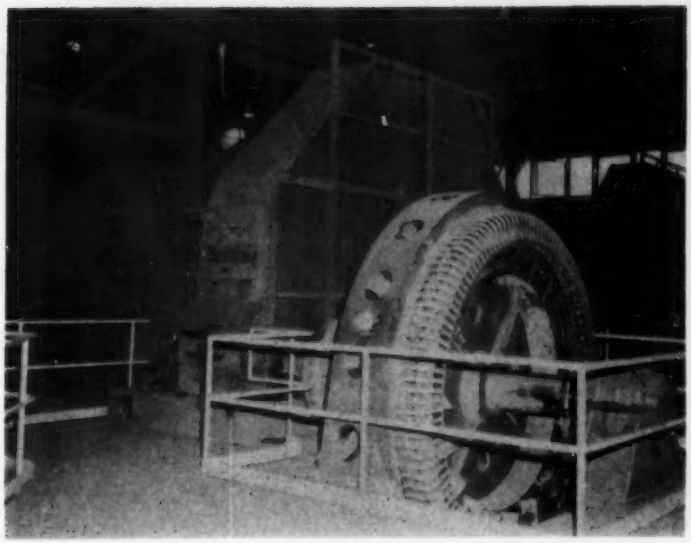
The four collectors for the milling circuits are identical in size, each having 864 cloth bags with a total area of 10,368 sq. ft. However, to offset possible deleterious effects of moisture and combustion products from the hot air furnaces, the collectors in the raw mill circuits are equipped with Orlon bags. In the finish mill circuit collectors, cotton bags are installed.

Controls, indicators, and recorders for all mills are housed in an enclosed control room and each circuit has its alarm system with a horn, lights, and a silence button. Each alarm may be silenced, but the warning lights will remain on until the fault is corrected. These alarms include the following: compressor water off, lubricator, feeders, furnace draft, furnace high tempera-



TWO PARALLEL unloading systems have been installed at the mill. An operator's booth between the two dump hoppers houses a control panel for the interlocked feeding and conveying systems with which raw materials are transferred to mill feed storage silos.

EACH milling circuit, two raw and two finish, is an independent system. Raw mills are 11½- by 17-ft., 1,250-hp. units, and the 1,500-hp. finish mills are 13- by 16-ft.



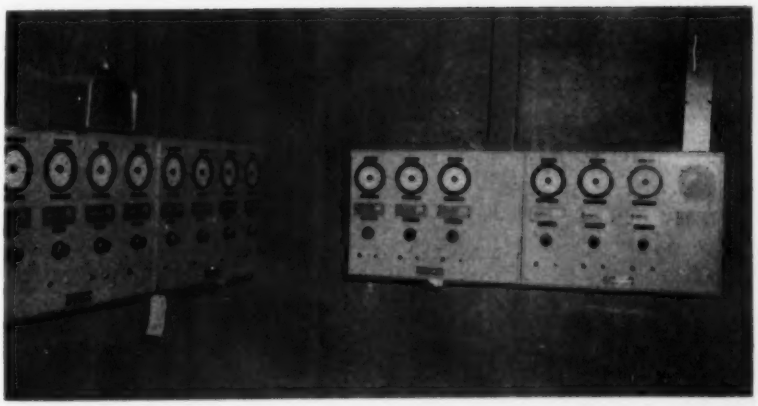
ture, and dust collector high temperature. For maintenance and inspection of the mills, a control panel is used for spotting, with power supplied from a 300-amp. welder. Only one mill is spotted at a time.

Two V-type direct-driven air compressors are also housed in the mill building. These provide air for several operating phases, including kiln and raw mill instrumentation, dust collector rapping, spray lubrication, and general utility.

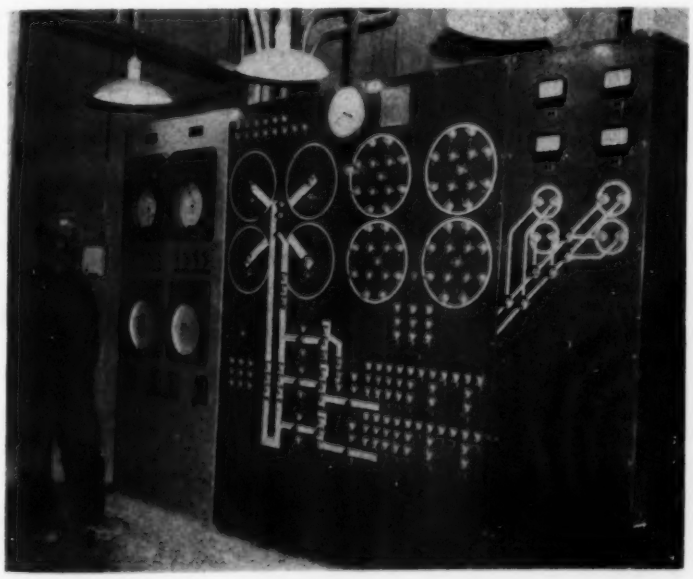
Kiln Feed From the raw mill separators, the raw grind is transferred by the individual pumps through 8-in. transport lines to a group of four homogenizing silos. Each of the 40-ft. diameter silos has a capacity of 4,000 bbl., and has a conical bottom. Homogenizing air is provided by a pair of non-lubricated 20 x 13 horizontal, double-acting compressors. When a silo has been filled, aeration is initiated in one 90-degree sector at a time, progressing in 45-degree steps.

The bottom of each silo is paved with 248 concrete plates which are divided into eight 45-degree sectors. At any given moment, two adjacent sectors are being furnished air, each plate receiving 17 c.f.m. (atmospheric). With the creep method, every 7½ minutes the 45-degree sector trailing (in the rotation) is shut off and the sector next ahead of the leading one is turned on. Thus, every 7½ minutes, the 90-degree sector which is blowing advances 45 degrees.

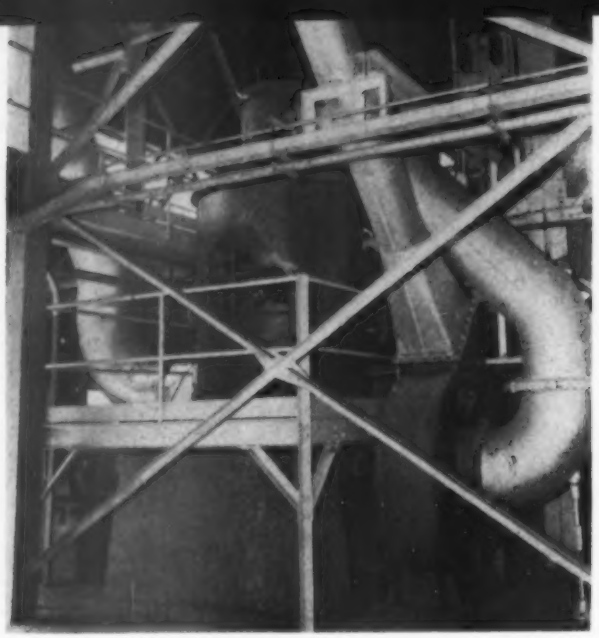
Sixty minutes are required to complete a cycle, and the homogenization in a given silo is maintained for about four hours. The compressors providing homogenizing air are water-cooled, and cannot be operated unless water is running through the water control valves with which they are equipped. They may be used alternately on aeration



ABOVE: Proportioning of raw mill feed is controlled by "chemist's panels". Once the desired composition has been set on these panels, it remains constant until the chemist makes a correction. Mill operators can regulate the rate of mill feed, but not the composition.



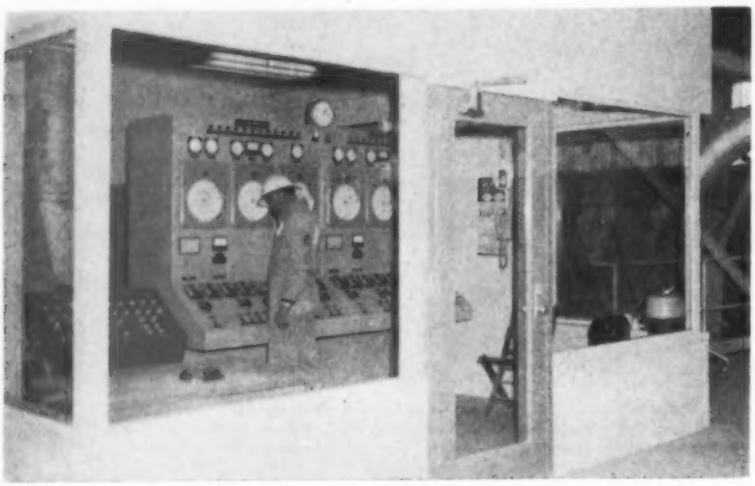
THE DIAGRAMMATIC control panel with which homogenization of kiln feed is maintained and regulated.



ONE OF THE TWO direct-firing coal mills which are rated at 7.6 t.p.h. As delivered to the kiln burner pipes, the coal has been ground to 85 percent passing 200 mesh.

or for withdrawal to supply the kilns. Dust collection from the homogenizing silos is handled by a 7,000-c.f.m. collector, which is also used to alleviate the pump systems, compressors, and to suppress dust in the screw and elevator system.

The homogenized feed is withdrawn through airlocks and drawout screw conveyors into a surge hopper, and is transferred via another system of screw conveyors to the kiln feed elevators. An accompanying photograph illustrates the diagrammatic control panel with equipment and flow indicator lights that is installed below the homogenizing silos.



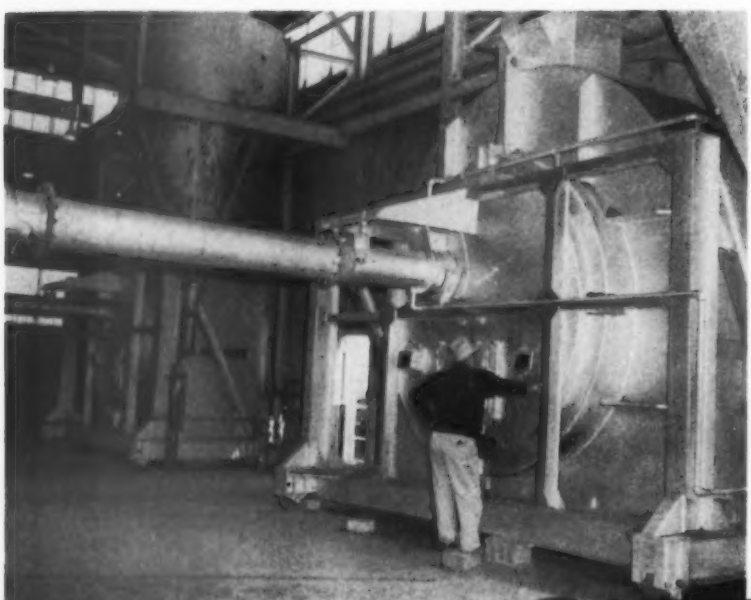
ABOVE: This central air-conditioned control room on the firing floor houses instrumentation and controls for coal feeders, coal mills, kilns, and coolers.

Kiln Department The two 12- by 390-ft. kilns ride on five tires, and each is provided with a dual drive, i.e., a pair of 100-hp. motors connected through Dynamatic couplings to the pinions and helical drive gear. Emergency drive is available with 35-hp. engines. The kilns are fired with pulverized coal, and exhaust gases are passed through individual spray chambers and electrostatic precipitators preceding a common stack.

Supplied from separate coal feed tanks, the two direct-firing bowl mills are rated at 7.6 t.p.h., with 85 percent discharge passing 200 mesh. Air for the mills is drawn from the kiln hoods, through cyclones, and is dropped to 180 degrees by dilution dampers. Approximately 90 lb. of coal are burned per bbl. of clinker. or approximately 1,100,000 B.t.u.

Firing zone temperatures are maintained at 2,600-2,700 degrees, and the kilns are operated at 62-65 r.p.h. Secondary preheated air from the coolers enters at 1,000 to 1,200 degrees, and feed end temperatures average 1,250 degrees.

Prior to entering the dust precipitators, kiln exhaust gases pass through spray chambers with four stages of spray nozzles. A tempera-



A VIEW on the open firing floor of the kiln hoods and burner pipes.

ture recorder-controller operated by thermocouples in the inlets of the precipitators controls the operation of the spray banks through solenoid valves, and drops the exhaust gas temperature to 650 degrees before it enters the precipitators. A dilution damper has been installed in the duct work as an emergency cooling method in case the sprays fail to reduce the temperature sufficiently. Spray water is provided by three 43-g.p.m. pumps.

Each of the dust precipitators is a 2-stage unit divided by a partition to permit isolation of one-half while the other is energized. The dust hoppers discharge through motor-operated gates to screw conveyors, which return the material to the kiln feed elevators. Induced draft for the two burning systems is provided by 125,000 c.f.m. fans, and the cleaned gases are discharged to the 12- by 300-ft. stack.

In the kiln department flow, the incoming feed is raised in elevators to kiln feed screws which are driven in synchronization with kiln speed. A system has been provided to weigh the amount of material delivered to the kilns. It involves diverting material *via* a gate in the spout of each of the feed elevators to a weigh box on a scale.

As discharged from the kilns, the clinker is received in air-quenching inclined grate coolers which are provided air by 100-hp. blower fans rated at 64,526 c.f.m. After passing through a clinker breaker on each cooler, the clinker is delivered to an 18-in. horizontal drag conveyor. From the latter it may be diverted at a transfer point on outside storage, or transported on a system of 24-in. conveyors to a double-roll crusher above the storage silos. This crusher is set at ¾-in. to provide a suitable finish mill feed size.

The kiln controls and instrumentation are housed in a central air-conditioned control room off the burner floor. Standard controls include those for the cooler, coal mill, kiln and coal feeder rheostats, and hood draft. Multiple pen circular chart recorders indicate hood draft; burning, feed housing, secondary air, and dust collector temperatures; kiln speed; coal feeder speed; and oxygen and combustibles percentages.

There are two groups of pressure flow and temperature indicating instruments. In the first are those for the feed end and hood draft, damper position, cooler vent temperature, and secondary air flow. The second group includes instruments for recording inlet draft, outlet pressure, and temperature, all on the coal mills. Space has been provided on the control panel for the installation of a television monitor.

Finish Milling In the finish milling circuit, the respective lines are fed by 200-bbl. per-hour feeders from the clinker silos, and 15-bbl. feeders from gypsum storage. As detailed previously, the ground clinker is elevated to the separators, which are cooled by atmospheric air. The finished cement is transported through 6-in. lines to the storage silos.

Storage and Loading Cement is stored in 100-ft. high silos that were built to serve the old plant. Four of these, 40 ft. in diameter, have a combined capacity of nearly 110,000 bbl. and were built with flat bottoms and draw points from which cement is spouted to four screw conveyors. Two portable pumps were recently installed to deliver cement from the screws to the packing and loading facilities.

Another group of twenty-four silos, 26 ft. in diameter and 100 ft. high, have a combined capacity of 264,000 bbl.; these were built with conical bottoms. A portable 7-in. pump is also provided for each row of four silos in this group. All pumps are provided with air by 100-hp. rotary compressors.

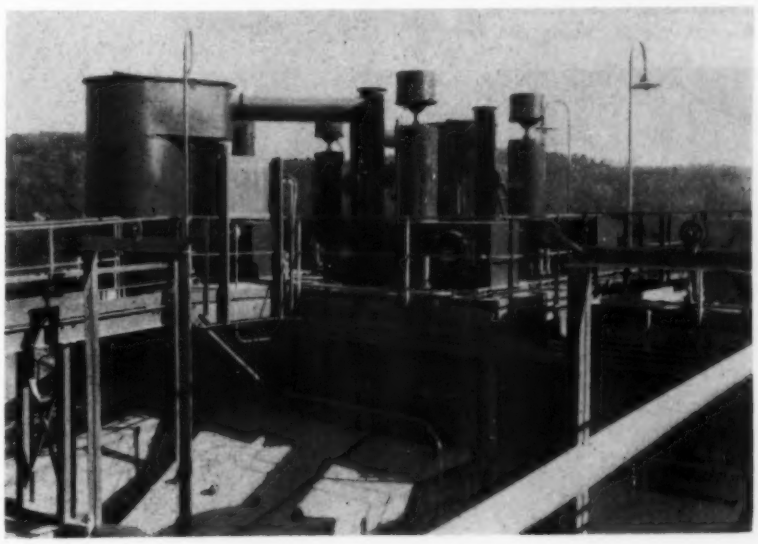
At present, bagging is carried out in the old packhouse. This installation, however, will be completely replaced when current plans are completed. Bulk loading of railroad cars is done with facilities that include a pair of hopper-bottom steel tanks, and a rail car and truck 60-ft. platform scale with a capacity of 300,000 lb.

An additional installation for bulk loading of trucks alone was provided as a part of the new plant. This is comprised of a pair of 3-compartment concrete silos above a set of 50-ton truck scales with 60-ft. platforms. All scales are equipped with print-outs to record empty and loaded weights. The scale control room was installed below the silos and at truck-top level between the silos.

Expansion of bulk loading facilities for this operation required close attention, also, to the possibility of excessive loss of product in the form of dust. This problem was compounded by the factors of air pollution and plant housekeeping.

To prevent an unfavorable situation, two dust collectors were installed above the truck-loading silos, and a pair of units above the combi-

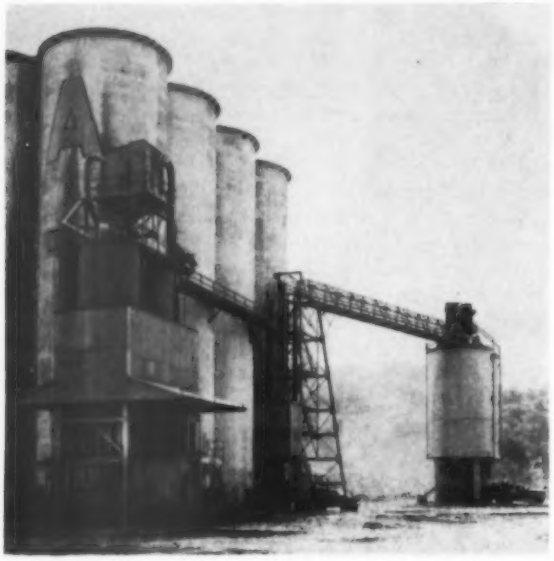
PRIOR to entering the dust precipitators, the kiln exhaust gases pass through 4-stage spray chambers in which the temperature is reduced to 650 degrees F.



ANOTHER VIEW of the kilns from the top of a homogenizing silo. In the left background are the finished product storage silos, the only facility retained from the old plant aside from the office building and some auxiliary structures.

nation rail-truck loading tanks. In each instance, this equipment serves to ventilate the silos, and to collect dust from loading operations. Although each pair of three-tiered units has a common wall, the individual units are actually separate operating components.

The 7A Dynaclones have a total capacity of 5,415 c.f.m. — 1,335 c.f.m. maintained on the bulk loading, and 4,080 c.f.m. for silo and pneumatic-conveying ventilation. Together, dust collection totals about 360 lb. per hour. Virtually the same conditions prevail at the rail-loading point.



BULK LOADING of both railroad cars and trucks can be handled with the new installation at the left. The silos at the right are part of the new bulk loading station that handles trucks only.

General In addition to the operations described in the foregoing, BrikseT, Medusa's masonry cement, and high-early-strength cement are produced in a separate regrind plant. The latter includes a pair of tube mill and separator circuits which had formerly been used on standard production, and raw material silos that had been used for blending and kiln feed tanks.

Electric power for the plant operations is obtained from a public utility, and brought into the mill at 69.0 kv. In the main transformer sub-station, this is stepped down to 4.16 kv. Transformers and switchgear are used in the eight section main sub-station, (two for incoming power, six for distribution). Unit power sub-stations are located near the various departments to provide 480-v. power. The large motors are provided with 4,160 v.

Operations of this outstanding new Medusa plant are headed by Arden F. Krebs, manager. Assisting him are Peter Schena, production superintendent, who has a record of service at this location since 1923; D. R. Nelson, maintenance engineer, who took this post after

ARDEN KREBS, center, plant manager, with Don Nelson, left, maintenance engineer, and Pete Schena, right, production superintendent, who has been associated with operations at Wampum since 1923.

transfer from the York, Pa., plant; and Alvin D. McCandless, plant chemist, who heads product control in the modern new laboratory. Foreman for the quarry, crushing and transportation phases is Harvey G. Yoho.

In addition to Ellery Sedgwick Jr., president, and W. J. Worthy, executive vice-president, Medusa officials who played a leading role in the development of the new mill include W. B. Hanlon and J. F. Weigel. Mr. Hanlon, recently promoted to assistant vice-president, engineering, is responsible for all company engineering projects, construction, maintenance, and repair. Mr. Weigel, also recently promoted to the post of assistant vice-president for technical service and quality control, is responsible for operations in chemistry, technical service, and geology.

Among the suppliers of major processing and material handling equipment in the plant are Allis-Chalmers Manufacturing Company; Raymond Division, Combustion Engineering, Inc.; Fuller Company; Chain Belt Company; Barber-Greene; Research-Cottrell, Inc.; and Westinghouse Electric Corporation. Other important components were furnished by Northern Blower Company; Jeffrey Manufacturing Company; Johnson-March; W. W. Sly Manufacturing Company; White Motor Company; and Manitowoc Engineering Company.

Maule Industries, Incorporated, reported earnings of $662,079, up 161 percent from $254,006, on net sales of $10,728,930, up slightly from $10,687,140. (Total earnings for the first six months of 1959 include a profit of $650,650 from sale of land owned by the firm; last year's figure also includes a similar profit of $236,777.) Earnings equal 89 cents per share, up 55 cents.

Harold M. Martsolf and Vincent Laughlin of Butler, Pa., have sold Highway Sand & Gravel Company, headquarted at Portersville, Pa., to James M. Sixsmith of Churchill Borough and associates. The plant has a daily production of 800 tons of sand and coarse aggregate.

Research Program of N.B.C.A. Outlined at Mid-Year Meeting

MEMBERS of the National Bituminous Concrete Association, Inc., and their wives, totalling a registration of nearly 200, attended the organization's annual mid-year meeting, held July 19-22 at the Greenbrier Hotel in White Sulphur Springs, W. Va.

During the four-day meeting the delegates heard a progress report on the N.B.C.A. quality improvement program, a review of association activities and goals, and plans of committees recently appointed by President John W. Kelly. Co-sponsors of the mid-year meeting were the West Virginia asphalt paving contractors and the Virginia Asphalt Association.

The liaison committee of the Asphalt Institute and that of N.B.C.A. held a session during this meeting.

Delegates, who represented directors, governors, and members from many states, heard a comprehensive report given by Charles R. Foster, N.B.C.A. co-ordinator of research. Mr. Foster fully covered the association's ten-point quality improvement program; and those attending the sessions discussed ways of implementing this program. Particular stress was laid on strengthening the industry's competitive position through the production of top-quality bituminous paving—an objective which was enthusiastically approved by the membership.

John W. Kelly
President of N.B.C.A.

After the meeting the board of directors of N.B.C.A. announced that a special foundation will be formed soon to finance the association's research effort.

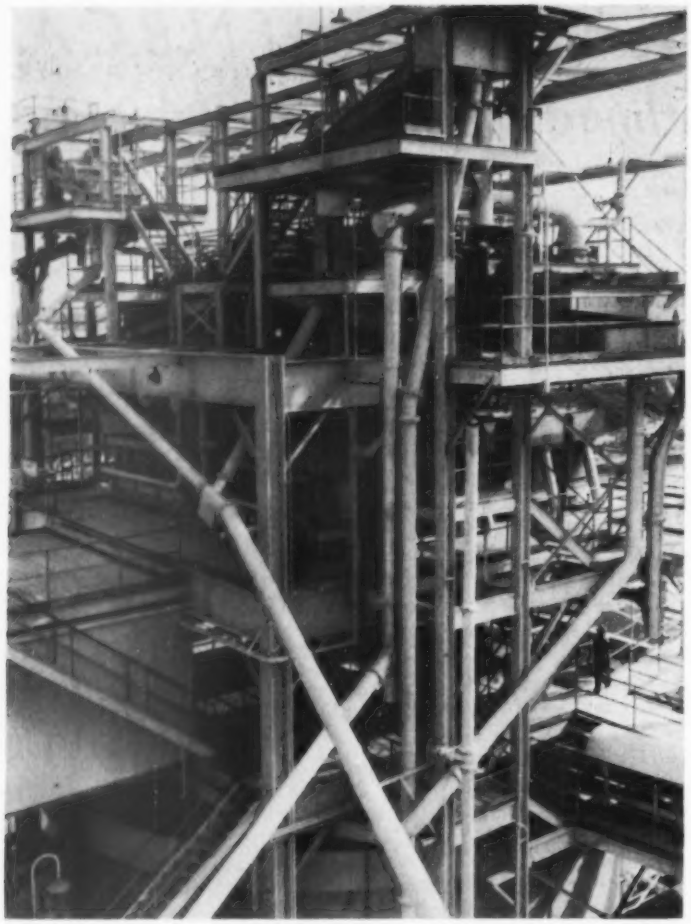
It was announced during the meeting that the N.B.C.A. quality improvement booklet will be reprinted. Proposed minor revisions were approved.

A study made by Mr. Foster indicated that a "pilot" study should be made on a segment of the association's literature before a full-scale survey is undertaken, to ensure that procedures being used meet the needs of N.B.C.A., and to obtain reliable cost estimates.

Fourteen state bituminous concrete paving associations were represented at the meeting of state secretaries, who discussed plans and problems affecting the industry in general.

N.B.C.A. headquarters are located in Washington, D. C., and the association's executive director is H. K. Griffith.

H. K. Griffith
Executive director of N.B.C.A.



THE FEED PREPARATION BUILDING. Scavenger screens and rake classifiers feed to two rows of five 6-pocket sizers. These make coarse, medium, and fine splits.

Florida's features—

By WALTER E. TRAUFFER

ANOTHER ON THE SPOT REPORT

AS IS true in many other industries, phosphate producers in Florida are finding it necessary to work deposits which offer increasingly difficult and expensive recovery problems. The answer to this challenge has been the use of larger mining equipment and the development of washers with more efficient methods and equipment. In this way it has been possible to keep

Unique methods result in—

- low manpower requirement
- compactness of layout
- simplicity of design
- low cost of production

newest phosphate washer

Flotation of Coarse Feed

Air Agitation in Flotation

costs down while at the same time making a better product.

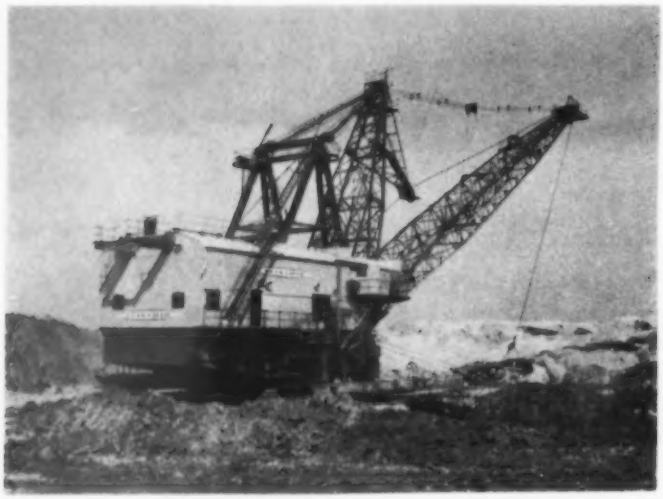
An excellent example of this trend is the new Orange Park, Fla., washer and mine of the American Cyanamid Company, which went into operation in May, 1957. This modern new plant is the farthest north of any washer in the area, being 3 miles northeast of Lakeland; and there are no known pebble phosphate deposits either north or west of it. This deposit averages about one-third phosphate, one-third sand, and one-third finely-divided phosphatic clays not now usable. All products are shipped *via* the Atlantic Coast Line to the company's drying and processing plant at Brewster, 30 miles south, getting a low in-transit rate.

Designed by the company's local engineering staff, the new plant is a refinement of the company's Sydney plant, 15 miles west of Mulberry, which was built in 1949. Both operations are notable for their simplicity and compactness and are said to be the only ones using flotation on coarse feed. This method eliminates belt concentrators, underwater screens, concentrating tables and spirals, etc. It was designed for ease of operation and maintenance and for low manpower requirements.

The Orange Park washer and mine replaced the company's Saddle Creek operation 3 miles east of Lakeland, which was shut down in January, 1957, after 13 years of operation. The new property had been prospected and purchased years before with this move in mind. Construction of the new plant was begun before the old one was shut down, so there was little delay in getting back into operation.

Much of the equipment is new, but some was moved over from Saddle Creek. The latter included the two large draglines which were walked to the new site a distance of 5 miles across country, over railways, across creeks, etc., in one week. These draglines were used first to build dams, settling areas, etc., and they moved about 3 million

THE NEW Orange Park, Fla., washer of the American Cyanamid Company, as viewed from the main highway. Car-loading bins are in the foreground.



ONE OF THE TWO 18-cu. yd. walking draglines used at the mines. This unit is casting matrix to the sump, from which it is fed to the plant.

cu. yd. of dirt by the time the new plant went into operation on May 1, 1957.

Mining About half the 6,000-acre property is poorly-drained swampland, so it was necessary to develop a drainage system before operations could begin. This was done by small draglines.

In mining, the 10 to 30 ft. of sand, muck and clay is removed by the draglines and overcast back into the worked-out section of the mine. The 4 to 10 ft. of matrix is dug and piled at a sump or well, where it is hydraulicked into the well by means of 6-in. Georgia and Universal guns. These use 4,500 g.p.m. of water at 150-lb. pressure. A 16-in. dredge pump picks up about 600 cu. yd. per hr. of matrix in slurry form with about 35 to 40 percent solids.

This pump discharges through a pipeline to a relay well, usually about 3,000 ft. away. Booster pumps are also used between wells. Return process water from a settling area is used for sealing these pumps and for hydraulicking. Pumping operations will eventually be extended to a maximum of about 4 miles. Georgia Iron Works and Maddox 16-in. pumps are used along with 16-in. Armco special abrasion-resistant spiral welded pipe.

Washing At the washer the pumpline discharges the slurry into a header box or receiving tub, which breaks the flow and splits to two parallel identical flows. Below each tub there is a stationary screen, followed by a Tyler 1-deck vibrating screen (No. 1) — each equipped with ½-in. bars. The mud balls, etc., over the latter drop to a company designed hammermill, then into a sump, and are then pumped back to the receiving tub.

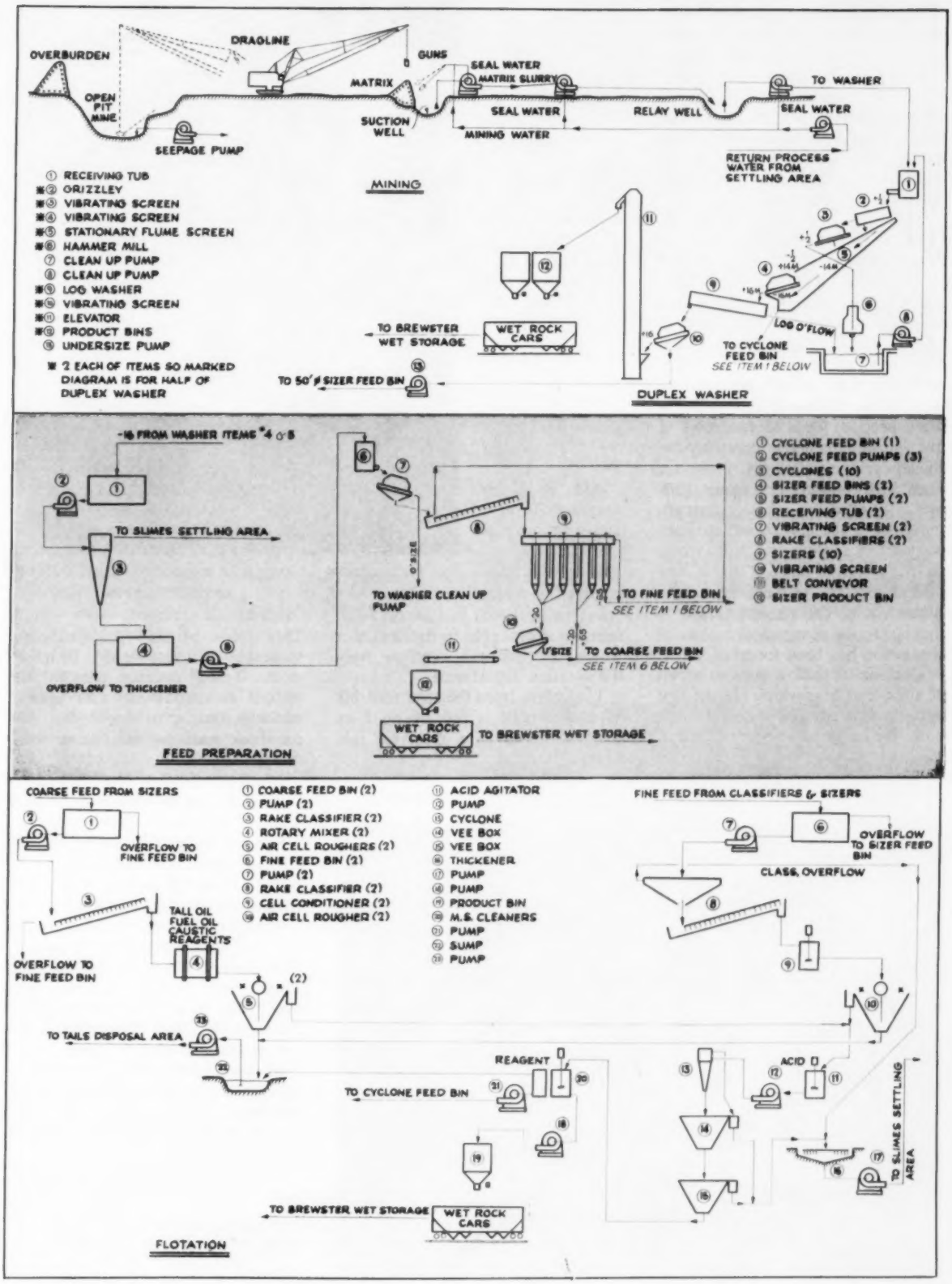
Minus ½-in. material through these screens drops on a long stationary flume screen with $\frac{1}{2}$-in. punched metal. The material over this (20-mesh to ½-in.) goes to a Tyler 1-deck vibrating dewatering screen (No. 2) with 16-mesh cloth. The minus 20-mesh throughs from this and from the flume screen go to the cyclone feed bin in the feed preparation department.

Plus 20-mesh material over the second vibrating screen goes to a McLanahan and Stone log washer which polishes and cleans the clay off the pebbles. The overflow goes to the same sump already described for return to the receiving tub.

The log washer product, pebble phosphate, is discharged for final cleaning and dewatering over a Tyler screen (No. 3) with 16-mesh

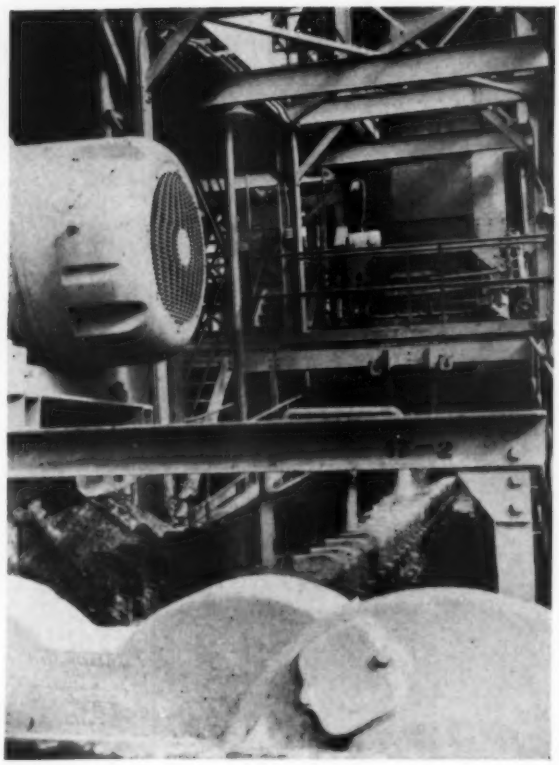
AT THE SUMP, hydraulic guns wash the matrix to the first of a series of 16-in. pumps which feed it 2 miles to the washer in slurry form.

Schematic Flow Diagram of American Cyanamid's Florida Plant — In Three Sections



cloth. The minus 20-mesh undersize is pumped to a 50-ft. diameter sizer feed bin.

The 20-mesh to ½-in. oversize is finished pebble phosphate, forming 40 to 45 percent of the total output. A bucket elevator carries this material to the product bin—there is a 300-ton circular steel bin for each of the two flows. These bins load direct into 60-ton wet rock cars, which carry this product to the processing plant at Brewster.



ONE of the two log washers which polish and clean the clay off the pebbles received from the dewatering screens (background).

Feed Preparation The cyclone feed bin gets not only the minus 20-mesh fines through the screens in the washing department, but also the overflow from the cleaner cells in the flotation department. A 16-in. Georgia pump, with two 8-in. pumps arranged to supplant or replace it automatically when needed, feeds to two rows of five 48-in. diameter company-designed cyclone separators. These are lined with rubber. The minus 150-mesh fines from these, containing most of the clay, sand, etc., are wasted to a settling area from which recovery can be made if this is ever desirable. This waste forms about 8 percent of the phosphate fed to the plant; no economical means of separation has been found as yet.

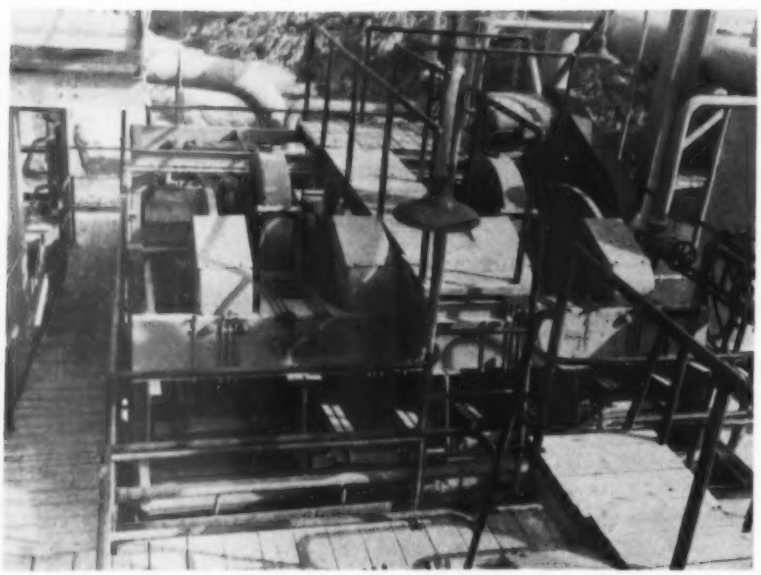
Cyclone underflow goes to a pair of sizer-feed bins which are the first units in two parallel series of flotation feed preparation. Overflow from these bins goes to the thickener which also gets the overflow from the flotation department.

Underflow from the sizer feed bin in each circuit is fed by an 8-in. Georgia pump to a receiving tub. This feeds to an Allis-Chalmers scavenger screen, with 10-mesh cloth. Tramp oversize goes to the washer cleanup sump and pump, which returns it to the washer department receiving tub, along with the raw matrix.

Material through the scavenger screen in each flow goes to a Dorr 4-rake classifier. This makes a rough 65-mesh split, removing a part of the fines overflowing by a flume to one of the two fine feed bins in the flotation department.

The rake product is fed through launders to a row of five 6-pocket Dorr Fahrenwald sizers. These make three splits—coarse, medium, and fine. The fine (minus 65-mesh) material from each sixth pocket goes *via* launders to one of the two fine feed bins in the flotation department, along with the overflow from the rakes.

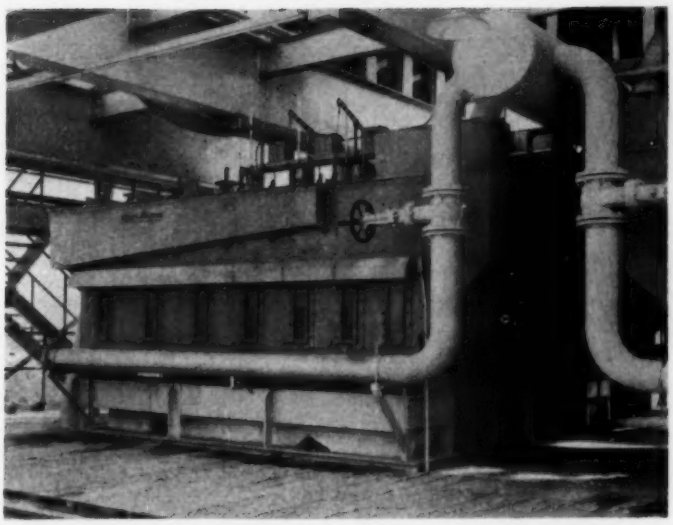
Coarse material from the first 2



ONE of the rake classifiers, which makes a rough 65-mesh split ahead of the sizers and the flotation department.

sizer pockets goes to a Tyler vibrating screen with 20-mesh openings. The 20- to 65-mesh undersize from this unit, along with the 20- 65-mesh product of the 3rd pocket, goes *via* launders to one of the two coarse feed bins in the flotation department.

The screen oversize is an in-between product, slightly lower grade than the pebble, forming about 5 percent of the total production. A belt conveyor carries this product to a 300-ton bin from which it is loaded into wet rock cars for shipment to wet storage at the Brewster plant.



A CLOSEUP of two of the 6-pocket sizers. Coarse goes to cars as wet rock; fines are flotation department feed.

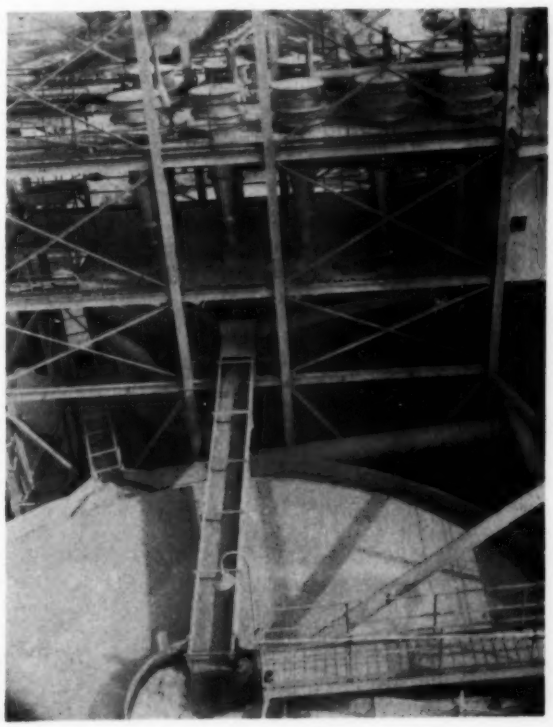
Flotation Washed feed ready for processing in the flotation department consists of fine phosphate and sand ranging from 20- to 150-mesh. There are three processing flows, two fine and one coarse, the only difference being in the amount of reagents used. This system makes for economy in the use of reagents, and it is said to be unique in coarse flotation feed.

From the coarse flow feed bins the overflow goes to one of the two fine feed bins. The coarse feed goes *via* a 6-in. Georgia pump to a Dorr Duplex rake classifier for further washing and dewatering. Overflow from the rake also goes to a fine feed bin.

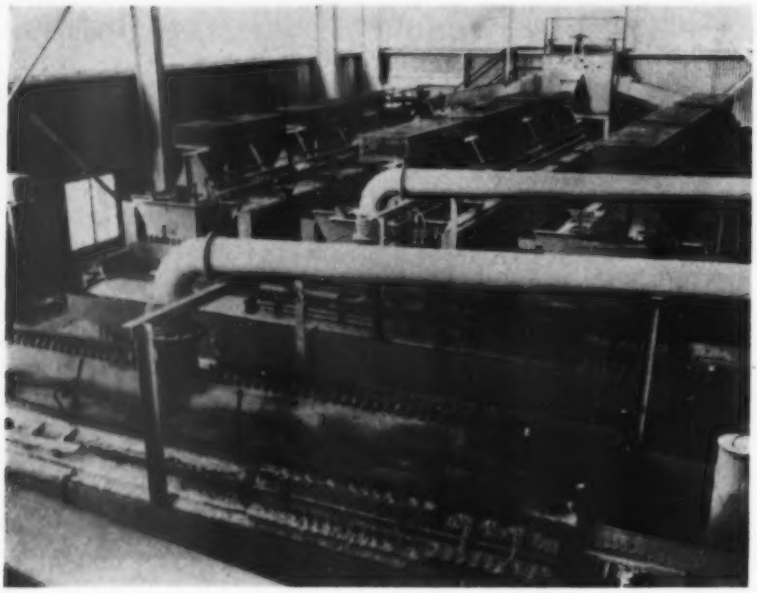
The rake product is fed, along with fuel oil, tall oil, and caustic reagents, to a rotary mixer, which in turn discharges to company-designed air cell roughers. Air for all of the cells is supplied at 3 p.s.i. by a 26,000 c.f.m. American blower. This cell makes a rough float of the phosphate and some sand, which goes to the final flotation stage of the fines flotation department. The sand from the bottom of the cells in both circuits goes to a sump and *via* a 16-in. pump to the tails disposal area.

The fine feed from the classifiers and sizers in the feed preparation department and the overflow from the two coarse feed bins go, as previously stated, to the feed bins of two identical and parallel flotation circuits. From each bin a 6-in. pump feeds to a Dorr 25-ft. diameter bowl classifier with a Quadruplex rake section. The overflow from the classifier goes to a thickener which serves both flows before they go to waste.

The product of the classifier goes to a vertical feed conditioner in which the same reagents are added as in the coarse department. In each circuit there are three company-designed air cell roughers. The underflow from these goes to a sump and a 16-in. pump (previously described), which also disposes of the



THE TWO ROWS of five 48-in. diameter cyclone separators which remove minus 150-mesh slimes. Minus 20-mesh product goes to the flotation feed preparation department. Sizer feed tank is in the foreground.



SOME of the rougher and cleaner cells in the flotation department.

underflow from the rougher in the coarse department.

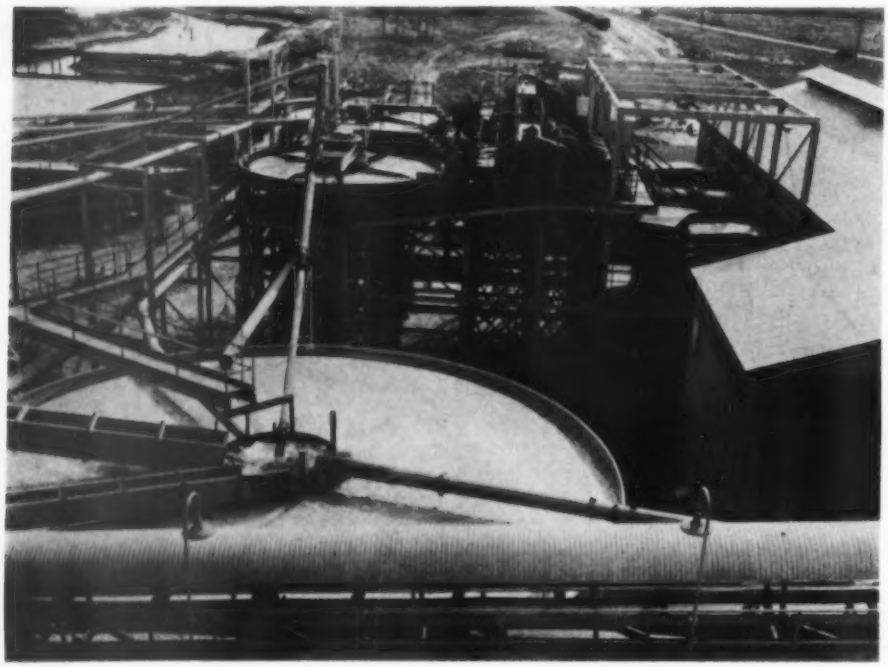
Overflow from the fine roughers and that from the coarse roughers, in both circuits, flows to an acid agitator, where sulphuric acid is added to remove the oily reagents. A 10-in. Georgia pump feeds from this agitator to two 48-in. acid-rinse cyclones. These are similar to the feed preparation cyclones but are inclined at 30 degrees from the horizontal. The cyclone product goes to two V settling boxes in series for further cleaning before final flotation.

Overflow from these cyclones and the two settling boxes in both circuits, with that from the bowl-and-rake classifiers, from both circuits, goes to a 500-ft. diameter Dorr thickener. This unit settles out the thin slimes, and the solids are pumped to the slimes settling area. The clear water overflow goes back to the plant for re-use.

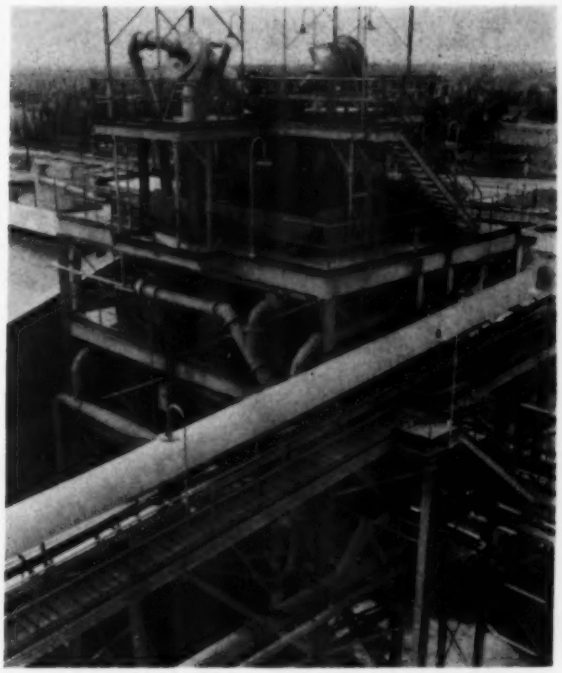
Clean feed from the V boxes goes to an M. S. cleaner, where an amine reagent and kerosene are added. These cleaner cells operate in reverse from the others, the silica being floated over the top. This float contains some phosphate. Overflow goes to the sump and is pumped to the tails disposal area or the cyclone feed bin.

The underflow from the cells is final concentrate and this goes, *via* a 6-in. pump, to six 300-ton steel bins for loading into cars. These cars also go to wet storage at the Brewster plant. All of the products average 18 percent moisture content.

BOWL-AND-RAKE CLASSIFIERS and conditioners at the flotation building. In the foreground is the thickener.



THE TWO 48-in. diameter acid rinse cyclones and V settling boxes which remove reagents before final flotation.



At Brewster some rock is shipped as is, and some is dried, ground, and made into various products, including triple superphosphate, sulphuric acid, and phosphoric acid.

Water This plant requires 40,000 g.p.m. of water, most of which is reclaimed from the settling areas. About 6,000 g.p.m. is fresh water from deep wells, which is fed to the cleaner flotation cells. Experience has shown that it takes 1½ acre-feet of settling area to provide the water for mining and processing 1 acre-foot of matrix. Operations were started with a 500-acre area; and as mining progressed, additional areas were diked in with overburden. The plant has a life expectancy of 10 to 11 years, and most of the area mined in the first 5 to 6 years will become settling area.

Personnel Officers of the American Cyanamid Company are: W. G. Malcolm, president, R. S. Kyle, secretary, and G. C. Walker, treasurer. Florida operations are controlled from the Brewster office. Arthur Crago is manager of phosphate operations, and K. K. Danton is his assistant. E. M. Haynsworth is mines manager, and S. C. Watkins Jr. is his assistant. W. J. Pace is chief engineer. At Orange Park, F. A. Vogler is mine superintendent, and Frank Boyd is mill superintendent.

1958 Fluorspar Output Slips For Second Successive Year

Shipments of fluorspar from domestic mines and mills in 1958 again decreased from the level of the preceding year. According to reports to the U. S. Bureau of Mines, maintenance of domestic production was aided by government acquisitions. The purchase program established in 1956 by Public Law 733 was terminated at the end of 1958, and the purchases of metallurgical grade material by the General Services Administration were concluded at mid-year.

Declines in consumption and in imports for consumption were also noted. Prices, however, remained practically at the same level.

Bentonite Production in 1958 Drops in Value and Tonnage

According to industry figures furnished to the U. S. Bureau of ines, bentonite production in 1958 dropped 11 percent in tonnage, and 14 percent in value from 1957. Wyoming, Mississippi, and Texas were the three leading producing states, with Wyoming alone accounting for 54 percent of the national total.

The foundry and petroleum industries were primary consumers, together using 75 percent of all tonnage mined, Both, however, registered decreases in 1958 compared with the preceding year.

The informative 16 mm. sound-color movie *From Mountain to Main Street* has been approved by the U. S. Information Agency as an educational film, and may be sent abroad duty free for viewing. The Winnipeg Fuel and Supply Company, Limited, Winnipeg, Man., was the first National Crushed Sand Association member outside of the United States to take advantage of the ruling.

Mexican Cement Concern Erecting 1,740,000-Bbl. Plant

Cemento de Atotonilco, S. A., Mexico, D. F., has announced that a cement plant is under construction at Atotonilco, Hidalgo, Mexico. This facility is to be a dry-process plant, and annual capacity is expected to be 1,740,000 bbl. Completion of the plant is scheduled for the end of 1961.

The announcement of the firm's project was made recently by Kenneth Bannister, managing director of Cemento de Atotonilco.

The State Department recently announced a $3,700,000 U. S. Government loan to the privately-owned Mindanao Portland Cement Corporation of the Philippines. The new plant will produce 150,000 tons of cement annually, saving an estimated $1,900,000 in foreign currency for the Philippines.

Billboard Posters Highlight

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THE latest in an annual series of billboard posters advertising agricultural limestone and its benefits has been established by the Iowa Limestone Producers Association, Incorporated. Available to members of this and other interested groups in Iowa, as well as to out-of-state producers or organizations, the 1960 series is the eleventh in a program which participating operators have found very effective in marketing agstone, both individually and on an industry-wide basis.

Firm believers in the premise that "it pays to advertise," members of the Iowa group feel that a constant reminder to the farmers and to the general public on the benefits inherent in liming will provide a strong boost to its use. The value of agstone as a neutralizer of acid soil is a basic feature in the billboard series. In addition, emphasis is given to the high return on dollars invested due to increased effectiveness of fertilizers when aglime is applied as a part of the soil treatment, and to higher crop yields. A reminder of time for application is also made.

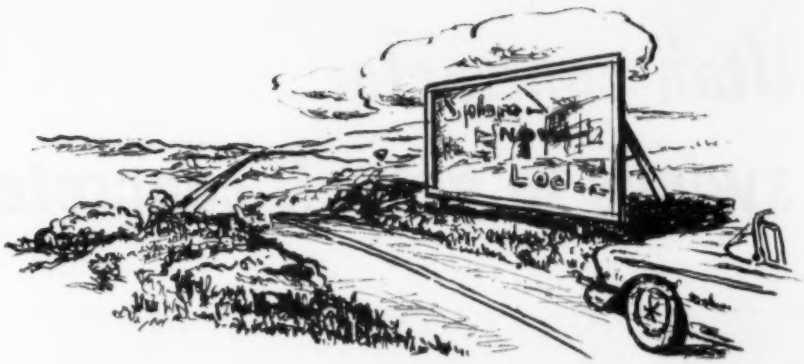
Each annual series of this bill-

In the kick-off of the 1960 series, the January-February poster indicates the permanent relationship between "top" soil and aglime.

In March and April, Poster No. 2 makes significant comment on potential dollar savings that can be realized.

Poster No. 3 suggests two more benefits accruing to adequately limed land.

Agstone



board promotional medium involves a set of six posters such as those for 1960 shown here. Each poster is displayed for a 60-day period, and carries the name of the participating producer or group in large letters below the illustration. All are finished with attractive coloring, and are designed to be readily visible at distances of 100 yards or more from the highway.

The posters may be obtained from the Iowa association by interested persons after contacting an outdoor advertising firm for rental of billboard space in a given area. Displays are then shipped directly to the billboard companies. As pointed out by officials of the above association, the cost for a full year of this form of advertising is nominal—slightly over $1 a day—and the message is presented every one of 365 days.

Agstone producers from other areas who may be interested in availing themselves of this program may obtain further information by contacting Clint A. Allen, executive secretary, Iowa Limestone Producers Association, Inc., 401 Teachout Building, Des Moines 9, Iowa.

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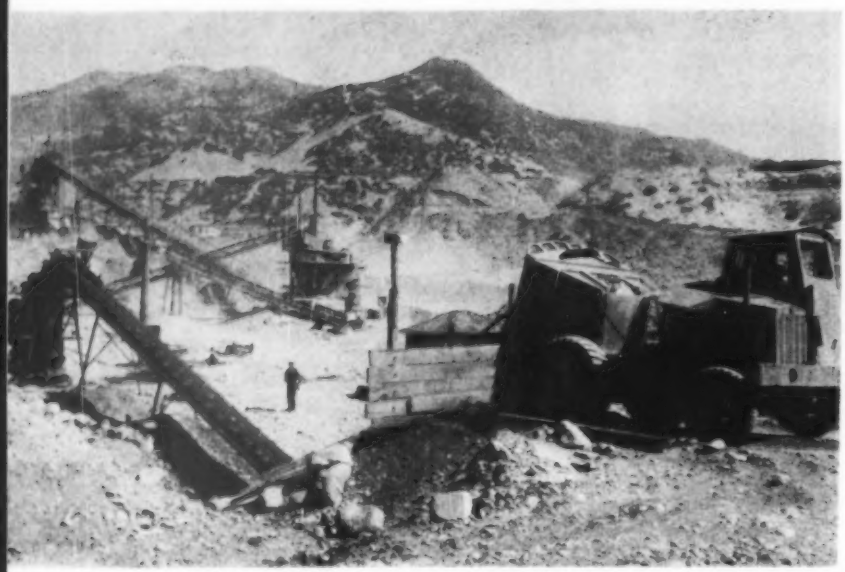
For July and August, poster No. 4 returns to the economic theme — one that universally hits close to home.

First things first for maximum results is the logical message conveyed by poster No. 5, the September-October display.

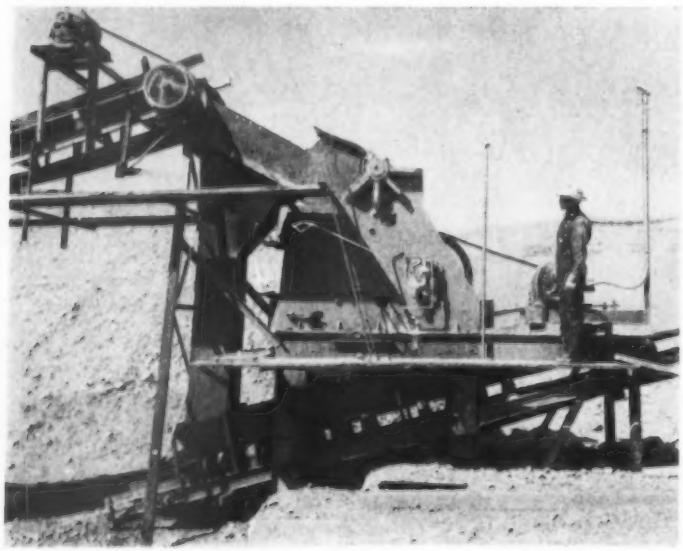
Even Mr. Claus has an important comment during November and December—get it on the land.

Utah contractor swings to gravel, concrete production



The Waterfall plant viewed from the pit hopper, showing the two crusher stations and final sizing tower (in the distance), tied together by belt conveyors.

The primary jaw crusher receives pit-run oversize by way of a sloping grizzly with bars spaced 3 in. apart.



By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

THE Clarence Waterfall Company, of Ogden, has been an important name in the construction scene in northern Utah for nearly a quarter of a century. Although still engaged in heavy-construction contracting, the firm's activity has, since 1944, swung more and more in the direction of aggregates and concrete production.

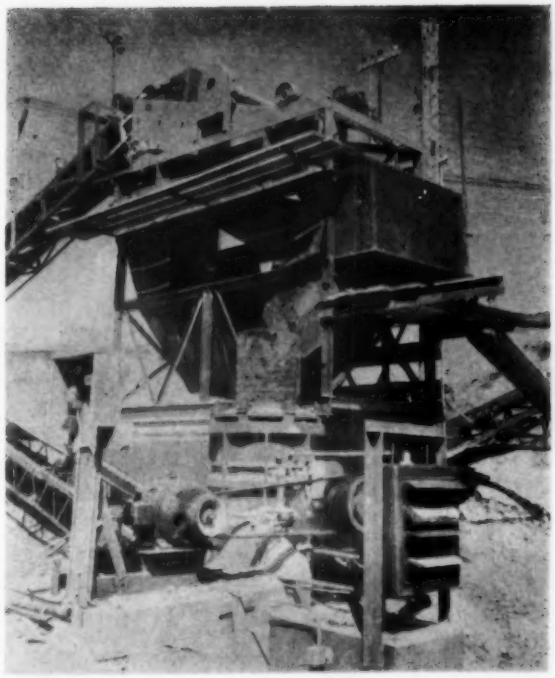
With the erection in 1957 of a new 200-t.p.h. sand and gravel plant at South Weber, the concern has become the largest producer of sand and gravel and related products in that section of Utah north of Salt Lake City. Two other pits and plants, at Brigham City and North Ogden, have now been converted chiefly to the straight production of road materials, particularly crusher-run and natural highway base gravels and sand.

About one-half of the entire output of washed sand and gravel from the South Weber plant is captive tonnage which goes to market in the form of ready-mixed concrete. Two permanent batching plants, in Ogden and in Clearfield, plus a new Noble-Mobile portable setup which can be shifted about to serve large-volume jobs, prepare concrete for mixing and delivery in the company's fleet of 16 to 18 truck-mixers. Most of these units are equipped with 2-way Motorola radios. The Waterfall Company also operates a Cummer hot-mix plant in Ogden, supplying asphaltic material.

The new South Weber aggregate plant obtains its raw material from

the broad bed of the nearby Weber River. The deposit contains sound, relatively clean gravel and sand to a depth of about 90 ft., where clay beds begin to occur. Excavation is not planned below this depth.

A Northwest 25 shovel swinging a ¾-cu. yd. bucket digs and loads to Koehring Dumptors which deliver to the plant hopper over a short haul radius. A belt conveyor carries from the hopper to a Kue-Ken 20- by 36-in. jaw primary crusher, the resultant minus 3-in. product then being conveyed to a 6- by 12-ft. Overstrom double-deck scalper screen. Top-deck rejects are chuted in direct choke-feed to a 28-in. Kue-Ken gyratory crusher set for reduction to about 1 in. and finer. Scalping-screen and secondary-crusher products are then recombined and transported by another belt conveyor to a washing-and-screening tower. If desired, however, the crusher can be closed-circuited with the screen by a short return belt.



Secondary crusher is set at ground level, below the scalping screen. The 1-in. product may be recombined with the screen throughs for delivery to the washing - and - screening tower or, at option, be in closed-circuit with the screen itself.

Gravel is processed on a 5- by 10-ft. Tyler Ty-Rock triple-deck screen equipped with washing sprays on all three decks. This screen is usually set up to yield two finished coarse aggregate combinations: minus 1½- plus ¾-in., and minus ¾- plus ¼-in. for use in the company's batch plants. Both concrete and plaster sands are processed—classified and dewatered in an Eagle Iron Works 26-ft. long screw washer and a Dorrclone 24-in. liquid cyclone. Overflow at the screw-classifier weir is pumped up to the cyclone by a 6-in. Galigher Vacseal rubber-lined sand pump.

Products are stored in truck-loading bins for delivery to the batch plants, yard, or customers, with surplus trucked for piling in the open.

Clarence Waterfall is president and active head of the company. S. J. Linford is general manager. Main offices, plus a ready-mix plant, aggregate stocks, and building supplies are maintained at a yard near downtown Ogden.

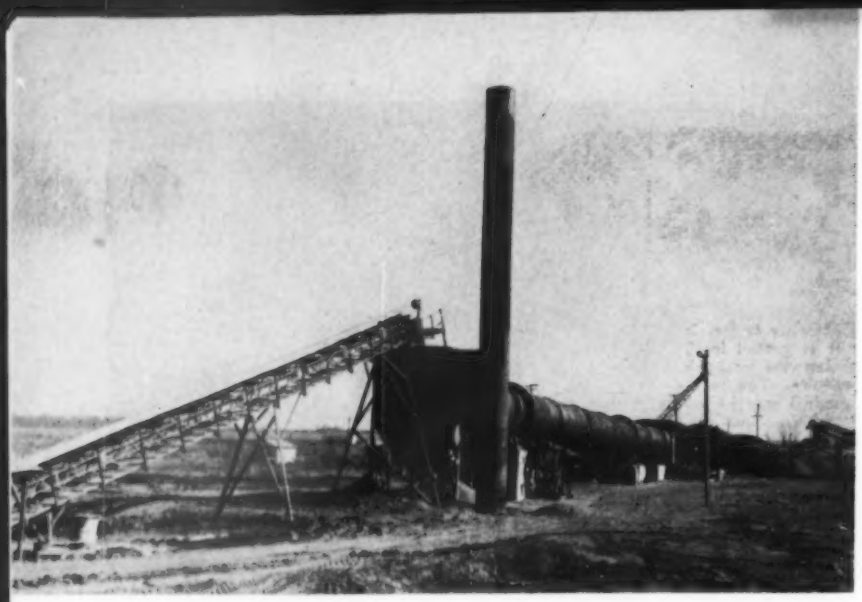
Gerald Waterfall heads the heavy-construction division of the company. Plant superintendents include Roger Waterfall at South Weber, Nate Jensen at Brigham City, and Erwin Furgeson at North Ogden.

Waterfall's portable batch plant can be dismantled, transported to another location and quickly set up again to serve demands of the job. It supplements Waterfall's two permanent concrete plants.

Cement Production in Japan Declines During 1958

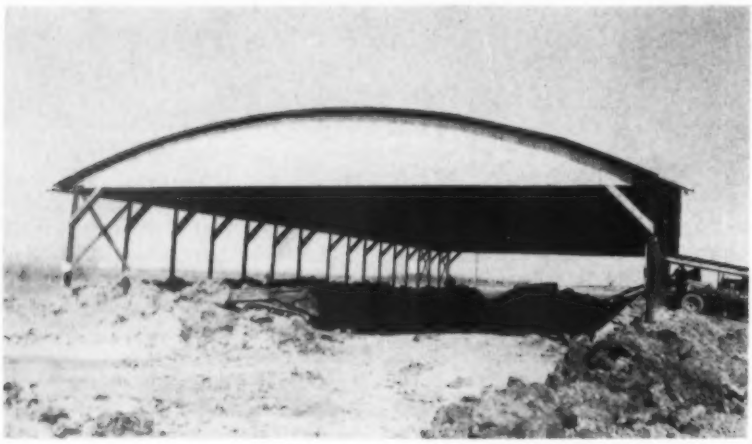
Production of cement in Japan during 1958 totalled 14,984,500 metric tons, of which 78,100 tons was white cement, compared with 15,175,700 tons in 1957, which included 69,200 tons of white cement. This decline is slightly more than 1 percent, according to figures released by the U. S. Bureau of Mines.

Production levels during June and July, 1958, dropped 5 percent to a monthly rate of 1,200,000 tons due to the decline in both export and domestic market shipments early in the year. Industry leaders predicted that production would increase to over 20,000,000 tons per year in the early 1960's.

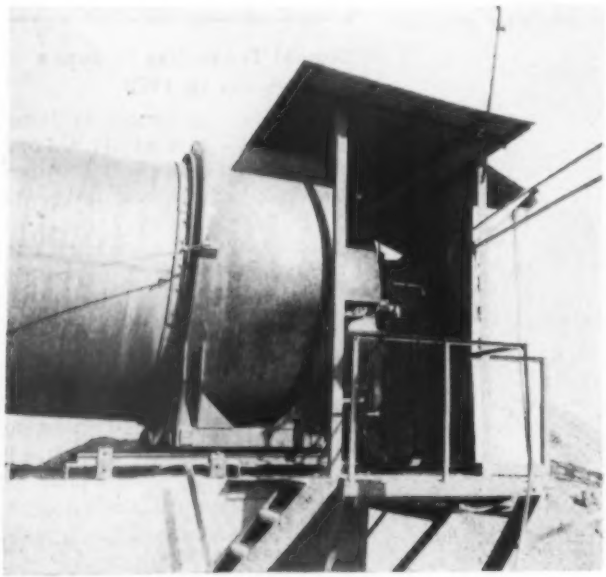


At the heart of the operation is this 8- by 125-ft. gas-fired rotary kiln. Clay feed has a top size of 3 in.

new



The clay shed provides cover for more than 5,000 cu. yd. of material when piled in a 10-ft. layer. Clay is excavated and transported to the shed by pan scrapers.



Kiln firing temperatures of 1,800 to 2,000 degrees F. are controlled by optical pyrometer.

ANOTHER ON THE SPOT REPORT

IN less than 18 months of operation, Arkansas Lightweight Aggregate Corporation, a newcomer to the state's growing group of varied industry, has proven itself an energetic participant in lightweight construction materials markets.

Arkalite, the company's expanded clay aggregate, is produced in a rotary kiln operation near England, Ark., about half way between Little Rock and Pine Bluff, at the rate of more than 350 cu. yd. per day. Shipments, about evenly divided between truck and rail, are made up to 200 miles in all directions—an area that takes in the entire state.

Development of the operation followed an extensive survey of possible sites throughout the state where clays possessing properties amenable to bloating occurred in adequate quantity. This search turned up the area at England, where a 340-acre tract contains sufficient raw material for nearly a half-century of production at maximum capacity. In addition, the property is ideally situated with respect to truck routes, and is on a mainline of the Cotton Belt Railroad.

By May 1, last year, the plant had been built and placed in full op-

arka lite — product of Arkansas industry

By BUREN C. HEROD

eration. However, this spring it was decided to revise and improve the original kiln feed sizing installation in the raw material storage shed. This was done by replacing the original clay reduction unit with a company-fabricated crusher that is fed from a concrete feed hopper *via* belt feeder.

The overall plant layout provides a clean, uncomplicated processing flow. Included in the installation are an open-sided clay storage shed, which also houses the shredder; an 8- by 125-ft. gas-fired rotary kiln; crushing and screening equipment; a stockpile reclaiming tunnel; and a loading station.

Raw clay, which has a recoverable depth of 7 ft., is removed in the pit by LeTourneau-Westinghouse pan scrapers and transported to the clay shed. The latter provides cover for 5,500 cu. yd. of material when piled in a 10-ft. layer. However, twice that amount can be readily accommodated.

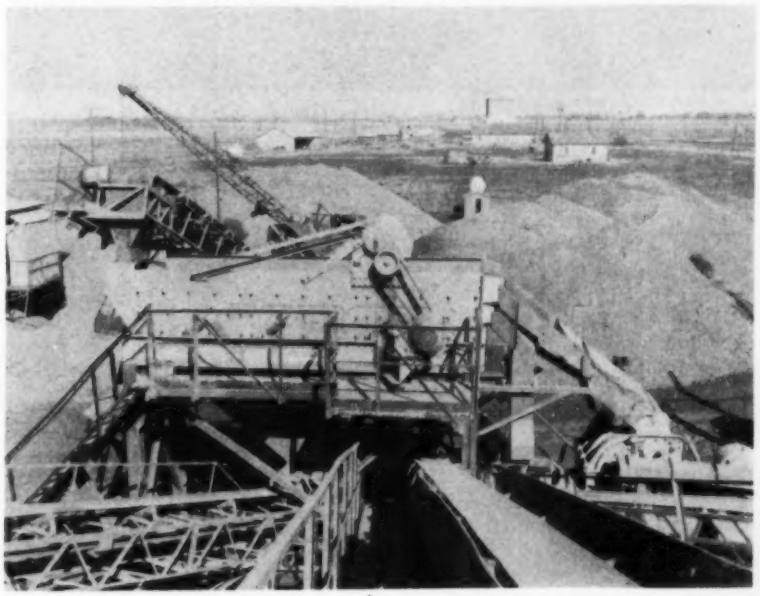
As required, the clay is bulldozed to the concrete feed hopper, from which it is delivered to the crusher by the belt feeder. Reduction is made to provide a top size of 3-in. for the kiln feed. The sized clay is received on an 18-in. by 100-ft. conveyor and transported to the kiln feed hopper.

Riding on two tires, the Standard Tool and Machine kiln is driven at about 1.25 r.p.m. It is lined throughout with LaClede Christy Acme refractories; and firing temperature, controlled by optical pyrometer, is maintained at 1,800 to 2,000 deg. F. Retention time of material in the kiln is about 30 minutes.

At the discharge end of the kiln the expanded clay pellets drop into a clinker pit. A clamshell-rigged Insley crane is used to rehandle the unclassified material in transferring to a stockpile or to the feed hopper of the screening and crushing operation.

A plate feeder delivers the unsized aggregate from the hopper to an 18-in. conveyor, on which it is transported to a 5- by 16-ft. triple-deck Cedarapids screen. Oversize from the top deck of this horizontal unit is chuted to a 40X33 Cedarapids hammermill, which is driven by a 75-hp. motor through poly-V Browning belting The other three fractions are delivered to the respective one of three 18-in. stockpiling belt conveyors.

As shown in an accompanying photograph, these conveyors are all equipped with sideboards to avoid spillage and wind loss. At the discharge point of the belt carrying



In the screening and crushing phase, from four to five finished sizes are made in a range of ¾ to 0.

Expanded clay pellets discharged into a pit from the kiln are rehandled to stockpile, or to the screening plant feed hopper, right, by a clamshell crane.

the smallest size of aggregate, this material is dropped into a vertical cylinder in which staggered discharge ports have been cut, and through which the fine aggregate flows onto its stockpile.

The product of the hammermill is returned on an 18-in. conveyor to the feed belt in closing the screening and crushing circuit. From four to five sizes of finished aggregate, in the ¾ to 0 range, are processed in the above operation. Stockpiles of individual fractions are separated by bulkheads, and each pile contains about 1,800 cu. yd. of finished material.

A tunnel below the stockpiles houses the first half of a 24-in. by 225-ft. reclaiming conveyor. Materials are drawn from the overlaying piles through clamshell gates, and conveyed to the loading point by the plant's rail spur. A turnhead at the discharge point of the reclaiming belt permits loading either railroad gondolas or trucks at the same location. Shipments are weighed out over scales.

All conveyors in the plant were fabricated by Wichita Industrial Manufacturing Company, and all incorporate Webster idlers carrying New York Rubber Cameo belting. In addition to the bulldozer and crane, utility equipment includes a rubber-tired Ford 841 diesel tractor with a front-end loader attachment.

Around-the-clock production by this vigorous addition to growing Arkansas industry is handled by a crew of 16 men who are supervised by Foster White, manager. Top officers of the company are C. R. Draper, president; K. Oliver, vice-president; and W. A. Turner, secretary.

Above, middle: Oversize from the screen is fed to the hammermill, and the crusher product returned to the screen feed belt.

Left: Finished products are transported on the reclaiming belt to the loading point, right, where they may be discharged through the swiveling spout into rail cars or trucks.

Winning Sand-Gravel Plants Cited In Bureau of Mines Safety Contest

AWARDS FOR superior safety records in 1958 were made by the Bureau of Mines, U. S. Department of the Interior, to 63 of the 174 plants competing in the National Sand and Gravel Safety Competition. These 63 plants were awarded Certificates of Achievement in Safety for having operated 20,000 injury-free man-hours or more during the year.

Participating plants competed in one of the two groups according to the type of operation: (1) bank or pit and (2) dredge. Twenty-eight of the enrolled operations were dredges, and 146 worked banks or pits. Competing plants represented 30 states.

The overall injury experience for the 1958 competition showed a frequency rate of 18.129 injuries per 1,000,000 man-hours and a severity rate of 1,732.15 days lost per 1,000,000 man-hours of exposure to hazard. The 174 participating operations in the sand and gravel competition worked 8,800,000 man-hours. Each employee of the top-ranking plant in each group was presented with an individual Certificate of Accomplishment in Safety.

Bank or Pit Group

For the fourth consecutive year the Lockport plant of the Material Service Corporation at Lockport, Ill., won top honors for the best safety record in the bank or pit group. In 1958 this plant accumulated 197,866 man-hours without a lost-time disabling work injury. During the 5 years that the Lockport plant has participated in the National Sand and Gravel Safety Competition, it has recorded only 6 days of lost time, charged to the 1 temporary total injury during a total worktime of 955,721 man-hours. Its 5-year injury-frequency rate was 1.046 per 1,000,000 man-hours and the severity rate 6.278 per 1,000,000 man-hours, each far below the corresponding rate for 1957 and for the 9-year history of the contest. The achievement of a perfect safety record for a fourth straight year proves that each employee and the entire management of the operation worked steadily to eliminate work injuries.

The 146 bank or pit operations participating in the 1958 Sand and Gravel Competition were worked almost 7 million man-hours. The injury-frequency rate for this group was 18.238, an all-time low rate for this group. The severity rate of 2,111.257 days lost per 1,000,000 man-hours of exposure to hazards of the industry reflected a 46 percent decrease over the group's 1957 severity rate of 3,885.540. This decrease was accounted for by the decreased number of days lost from fatal and permanent injuries. In the 1957 competition there were three fatal injuries while in 1958, only one injury resulted in death. This bank or pit group operated 6,963,624 man-hours during 1958 with 127 injuries—1 fatal, 3 permanent partial, and 123 temporary total lost-time injuries. These 127 injuries caused 14,702 days of lost time chargeable to the bank or pit group. The lost-time figure was 56 percent lower than that of 1957.

Dredge Group

The Kinder plant of Gifford-Hill and Company, Inc., at Kinder, La., had the best safety record among the 28 dredge operations enrolled in the 1958 competition. A certificate of Achievement in Safety was awarded to this plant for an injury-free record during 135,675 man-hours of operation. This is the first year that the Gifford-Hill and Company, Inc., plant has won the coveted certificate for being the top-ranking operation. The Kinder plant has participated steadily since 1953. During these 6 years of participation the Kinder plant has been operated 741,954 man-hours, with 15 injuries charged to its record. These injuries caused 13,978 days of lost time, resulting in an overall frequency rate of 20.217 injuries per 1,000,000 man-hours and a severity rate of 18,839.443 days per 1,000,000 man-hours. Special commendation goes to this plant for its perseverance in accident prevention.

The 28 dredge operations participating in the 1958 National Sand and Gravel Safety Competition worked 1,861,826 man-hours, with 33 lost-time injuries that caused 585 days of disability to be charged against its record. The dredge group's safety record revealed a frequency rate of 17.725 injuries per 1,000,000 man-hours—the second-lowest frequency rate in the 9-year history of the competition. (The lowest was 15.751 in 1954.) The severity rate of 314.208 days lost per 1,000,000 man-hours of exposure was the all-time low severity for this group of the competition. This rate was $\frac{1}{13}$ of the previous year's rate of 3,907.424.

Perfect Safety Records

In the 1958 National Sand and Gravel Safety Competition 106 competing plants operated throughout the year without a lost-time disabling work injury. Men at these plants, of which two were winners, worked 4,466,462 man-hours or 51 percent of the combined worktime of all enrolled plants. This injury-free group comprised 92 banks or pits and 14 dredges. The 106 perfect safety records included 43 operations, 38 bank or pit plants, and 5 dredges, operated less than 20,000 man-hours, the minimum requirement of the competition rules for consideration of certificate award. Personnel of these operations merit

heartiest congratulations for participating in each contest, knowing that they are not eligible for awards.

Injury-Free Plants

The plants (excluding the two winners) that worked 20,000 man-hours or more without a lost-time or disabling injury, which were awarded Certificates of Achievement in Safety were as follows:

Hoot pit plant, Gifford-Hill & Co., Inc., Texarkana, Ark., 159,343 man-hours.

Algonquin bank plant, Material Service Corp., Algonquin, Ill., 137,738 man-hours.

Eliot No. 104 bank-pit plant, Pacific Cement & Aggregates, Inc., Pleasanton, Calif., 134,915 man-hours.

Flint Sand & Gravel dredge plant, Jahncke Service, Inc., Bluff Creek, La., 133,839 man-hours.

Wilson dredge plant, Gifford-Hill & Co., Inc., Turkey Creek, La., 129,430 man-hours.

Fair Oaks No. 111 pit plant, Pacific Cement & Aggregates, Inc., Fair Oaks, Calif., 124,384 man-hours.

Lafayette pit plant, Western Indiana Gravel Co., Lafayette, Ind., 122,710 man-hours.

Crystal Lake Dept. No. 398 pit plant, Consumers Co., Crystal Lake, Ill., 110,128 man-hours.

Grey Cloud pit plant, J. L. Shiely Co., St. Paul Park, Minn., 97,175 man-hours.

Boonville No. 1 bank plant, Eastern Rock Products, Inc., Boonville, N. Y., 96,354 man-hours.

Centerville No. 106 bank-pit plant, Pacific Cement & Aggregates, Inc., Centerville, Calif., 96,346 man-hours.

Burt pit plant, Central Texas Gravel Co., Waco, Tex., 94,698 man-hours.

Kincaid pit plant, Livingston Rock & Gravel Co., Irwindale, Calif., 91,353 man-hours.

Morris dredge plant, Material Service Corp., Morris, Ill., 77,520 man-hours.

Irwindale bank-pit plant, Consolidated Rock Products Co., Irwindale, Calif., 76,911 man-hours.

Hudson pit plant, Gifford-Hill & Co., Inc., Hearne, Tex., 75,752 man-hours.

Portage bank plant, Industrial Silica Corp., Garrettsville, Ohio, 75,433 man-hours.

North Dayton dredge plant, American Aggregates Corp., Dayton, Ohio, 71,210 man-hours.

Kerlinger No. 114 pit plant, Pacific Cement & Aggregates, Inc., Tracy, Calif., 70,675 man-hours.

Columbus 2-C pit plant, American Aggregates Corp., Columbus, Ohio, 66,111 man-hours.

Jere pit plant, Southwest Construction Materials Co., Carrollton, Tex., 61,439 man-hours.

Quigley pit plant, Fort Worth Sand & Gravel Co., Hurst, Tex., 61,390 man-hours.

Highspire bank plant, Highspire Sand & Gravel Co., Highspire, Pa., 59,329 man-hours.

John pit plant, Southwest Construction Materials Co., Irving, Tex., 58,988 man-hours.

Richmond pit plant, American Aggregates Corp., Richmond, Ind., 53,737 man-hours.

Kaw No. 2 dredge plant, Stewart Sand & Material Co., Turner, Kans., 51,160 man-hours.

Circleville pit plant, The Sturm & Dillard Co., Circleville, Ohio, 49,190 man-hours.

Clayton bank plant, Concrete Materials Co., Clayton, Iowa, 45,610 man-hours.

Missouri River dredge plant, Stewart Sand & Material Co., Kansas City, Mo., 42,787 man-hours.

Irwindale pit plant, Manning Bros. Rock & Sand Co., Irwindale, Calif., 40,868 man-hours.

Cayuga bank plant, Material Service Corp., Cayuga, Ind., 40,831 man-hours.

Airways pit plant, Memphis Stone & Gravel Co., Memphis, Tenn., 39,773 man-hours.

South Dayton pit plant, American Aggregates Corp., Dayton, Ohio, 39,492 man-hours.

South Bend pit plant, Western Indiana Gravel Co., South Bend., Ind., 37,955 man-hours.

Fort Jefferson pit plant, American Aggregates Corp., Fort Jefferson, Ohio, 37,270 man-hours.

Correctionville pit plant, Concrete Materials Co., Correctionville, Iowa, 36,994 man-hours.

Gulf pit plant, Fort Worth Sand & Gravel Co., Fort Worth, Tex., 36,311 man-hours.

Plant No. 2 pit, Superior Sand and Gravel Co., Glendale, Ariz., 35,845 man-hours.

Leesburg dredge plant, Western Indiana Gravel Co., Leesburg, Ind., 35,557 man-hours.

Duarte pit plant, Arrow Rock Co., Duarte, Calif., 35,543 man-hours.

Ellis bank plant, The Zanesville Gravel Co., Dresden, Ohio, 35,133 man-hours.

Montezuma pit plant, Western Indiana Gravel Co., Montezuma, Ind., 35,000 man-hours.

Zachry pit plant, H. B. Zachry Co., San Antonio, Tex., 34,300 man-hours.

Cottonwood Heights pit plant, Utah Sand & Gravel Products Corp., Salt Lake City, Utah, 34,197 man-hours.

Ramsey bank-pit plant, McKee Bros., Inc., Ramsey, N. J., 33,360 man-hours.

Claremont bank-pit plant, Consolidated Rock Products Co., Claremont, Calif., 33,255 man-hours.

Lemon Cove No. 133 pit plant, Pacific Cement & Aggregates, Inc., Lemon Cove, Calif., 33,226 man-hours.

Massillon pit plant, The Standard Slag Co., Massillon, Ohio, 32,581 man-hours.

Holley bank plant, Gifford-Hill & Co., Inc., Van Horn, Tex., 30,396 man-hours.

Helena pit plant, Helena Sand & Gravel Co., Helena, Mont., 29,660 man-hours.

Barneveld No. 2 pit plant. Eastern Rock Products Inc., Barneveld, N. Y., 29,555 man-hours.

Alfred Station "AS" bank plant, The Buffalo Slag Co., Inc., Alfred Station, N. Y., 26,526 man-hours.

Booneville dredge plant, Concrete Materials Co., Booneville, Iowa, 25,981 man-hours.

Warren river plant, General Concrete Products Corp., Warren, Pa., 25,946 man-hours.

Lacona bank plant, The General Crushed Stone Co., Lacona, N. Y., 25,782 man-hours.

Allegany "A" bank plant, The Buffalo Slag Co., Inc., Allegany, N. Y., 25,685 man-hours.

Camden pit plant, Memphis Stone & Gravel Co., Camden, Tenn., 25,028 man-hours.

Knight bank plant, The Rubber City Sand & Gravel Co., Akron, Ohio, 23,844 man-hours.

Shippingport pit plant, The Standard Slag Co., (Shippingport Sand & Gravel Co.), Shippingport, Pa., 23,637 man-hours.

Lytle Creek pit plant, Service Rock Co., (Owl Materials Co.), Rialto, Calif., 22,335 man-hours.

Geauga bank plant, Industrial Silica Corp., Geauga Lake, Ohio, 21,926 man-hours.

Rules of Competition

All bank, pit, or dredge plants operating unconsolidated sand and/or gravel deposits in the United States are eligible to enter this safety competition, which is sponsored and conducted annually by the Bureau of Mines, U. S. Department of the Interior. Data collected for the statistics cover worktime of and injuries to all employees at the plant up to the point where the sand and gravel loses its identity, as in ready-mix plants.

The competition is divided into two groups — bank or pit and dredge — and in each group the plants are ranked in order of the injury-severity rate. In the injury-free operations plants rank according to man-hours worked.

Certificates of Achievement in Safety are also awarded to all plants that operated throughout the contest year 20,000 man-hours or more without a lost-time or disabling injury. The awards are provided by the Bureau of Mines.

Enrollment applications, rules, and information on the competition are available on request from the Branch of Accident Analysis, Division of Safety, Bureau of Mines, Washington 25, D. C.

Cement production increased from 472,100 tons to 544,000 tons in New Zealand during 1957-58.

...because they last many years longer than any product purchased for the same service! Elimination of downtime, replacement parts, etc., gives you the tremendous dollar savings now enjoyed by hundreds of Companies in the Cement Industry.

Here's why: "Tool Steel Process" parts are made of low carbon alloy steel. File hard wearing surfaces are backed by a tough ductile core, resulting in super resistance to wear and fatigue.

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THE TOOL STEEL GEAR AND PINION CO.
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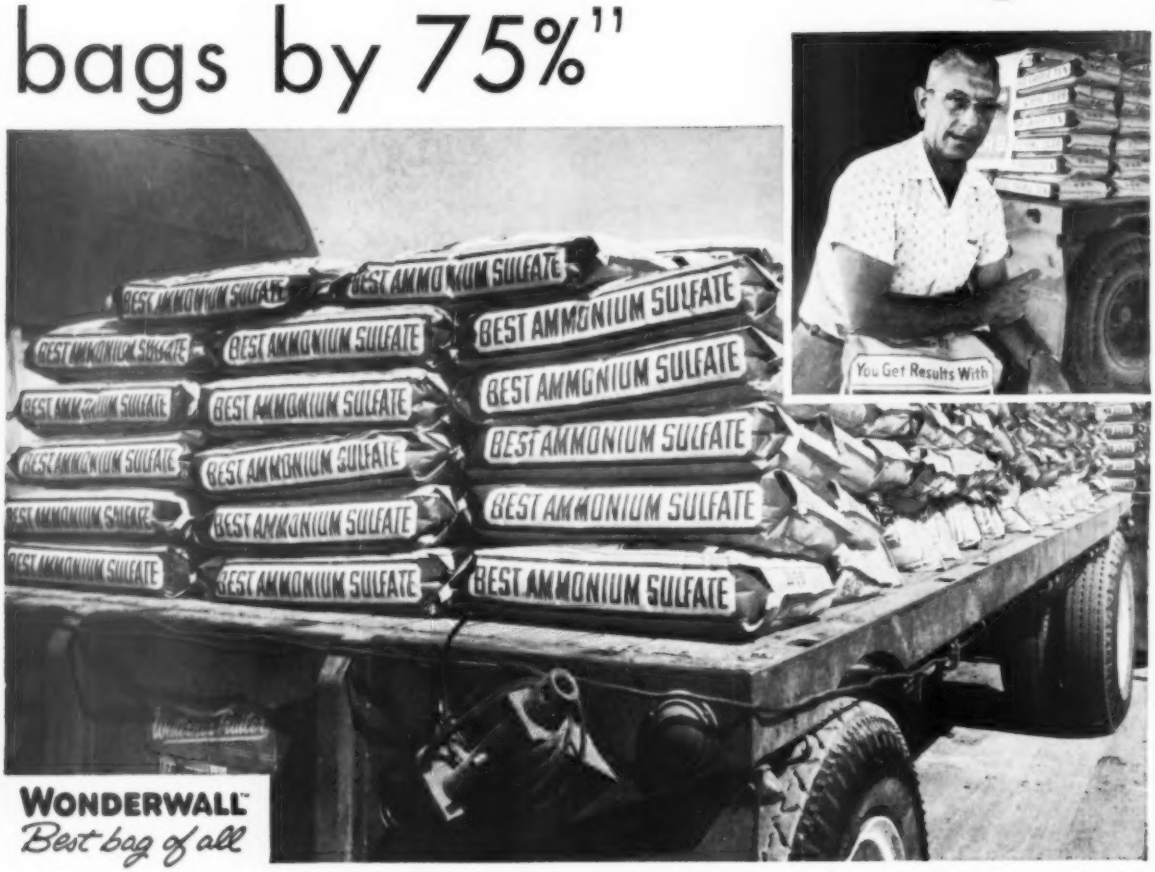
Ad No. 1002

"WONDERWALL™ reduced our losses from damaged bags by 75%"



"Losses caused by damaged bags have been reduced by at least 75% since we started shipping our twelve different formulas of ammonia phosphate and sulfate fertilizers in WONDERWALL bags," says Mr. Alfred G. Roecks, assistant plant manager at the Best Fertilizers Company, Lathrop, California.

The Best Company packs 80# of fertilizer in a sewn valve bag, 15" x 4½" x 32½". The old 4-ply natural kraft bag they used was 1/40, 2/50, 1/60, totaling 200# basis weight. The 3-ply WONDERWALL bag they are now using is 2/50, 1/70, totaling 170#. These bags—15% lighter—have proved to be *stronger* than their previous 4-ply bags!

WONDERWALL is West Virginia's new, tougher multiwall that outperforms ordinary bags because it's made of Kraftsman Clupak* paper. This extraordinary paper stretches and withstands punishment that breaks ordinary kraft. Best now plans to use bags made from Clupak extensible paper exclusively.

Besides obtaining reduced breakage, many companies packing fertilizers, feed, cement, chemicals and similar products are also achieving substantial *bag cost savings* through use of the lighter, tougher WONDERWALL bags.

Let a West Virginia representative show you how *you* can cut bag costs and reduce breakage. Write or call Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, New York.

**Clupak, Inc.'s trademark for extensible paper, manufactured under its authority.*

West Virginia Pulp and Paper

By C. E. GOLSON
Manager, Sales Department
Aggregate Beneficiation
WEMCO Division, Western Machinery Co.

Modern classification methods

applied to fine aggregates

PART III

AGGREGATES are defined as a mass of practically inert mineral materials which, when surrounded and bonded together by an active binder, form the reconstituted rock which is denoted by the general term concrete. According to the type of binder used, this concrete is portland cement concrete, hydraulic cement concrete, or asphaltic concrete.

Aggregates have three principal functions in the concrete: (1) they provide a relatively cheap filler for the concreting material, or binder; (2) they provide a mass of particles which are suitable for resisting the action of applied loads, of abrasion, of percolation of moisture through the mass, and of climatic factors; (3) they reduce volume changes resulting from the action of the setting and hardening of the concrete mass.

Aggregate Characteristics and Modern Specifications

Therefore, the influence of aggregates on the resulting concrete depends on the following general characteristics:

a) **Mineral character** of the aggregate, which governs the strength, elasticity, and durability of the concrete.

b) **Surface character** of the particles, which governs the workability of the fresh concrete and the bonding of the particles within the hardened mass.

c) **Size consist** of the aggregates as related to the workability, density, and economy of the mix.

d) **Amount** of aggregate per unit volume of the concrete, particularly as related to volume changes during the setting and curing process, and to the economy of the mix.

These general characteristics should be analyzed in more detail:

Mineral Character This character of the aggregate is defined by the use of three words: clean, sound, homogeneous.

Cleanliness means the removal of organic materials, which have weaker mechanical properties than the mineral particles and also interfere with the chemical reactions which are an integral part of the curing and setting process. Cleanliness also means the absence of clays, silts, and other slimes, which would interfere with the proper bonding of the binder with the aggregate.

Soundness pertains to both the immediate and the ultimate mechanical properties of the aggregate and of the resulting concrete. Immediate properties include resistance to abrasion, resistance to compression, resistance to impact. Ultimate properties include (1) low porosity, to avoid undue absorption of the water in the paste with a disruption in the setting and curing of the concrete, and also avoidance of water absorption into the aggregate itself which under the action of climatic factors would lead to its deterioration and disintegration; (2) mineralogical characteristics which would lead to differential expansion within the concrete mass or to deterioration due to climatic causes; and (3) chemical inertness, to reduce chem-

In Parts I and II **no attempt was made to enter into a detailed discussion of the reasons which require careful preparation of fine aggregates, nor of the fundamentals of classification as applied to the aggregate industry. Part III is presented as an amplification and clarification of some of the statements advanced in the foregoing installments.**

ical reaction with the binder constituents which would weaken the concrete mass.

Homogeneity denotes the removal of those fractions of the aggregate which because of a difference in specific gravity would segregate in the mix; or differences in mineralogical or chemical characteristics of the particles resulting in differential expansion or other physical actions within the mass.

Surface Character Three factors enter into the requirement of surface characteristics: angularity of the particles, reducing the workability of the mix and requiring either an added amount of water or an added amount of fine aggregates, a factor usually denoted by the term harshness; excessively smooth or polished surfaces of the aggregates, which will prevent proper bonding of the binder with the aggregate; and finally, the presence of flat or elongated particles, which will result in segregation and disrupt the uniformity of the concrete.

Size and Amount The size consist and the proportions of the constituents in the concrete mix are the most important requirements which aggregates have to meet. Without entering into details of concrete technology, which is a science in itself, certain salient points can be established which govern the sizing requirements.

In the case of portland cement, for example, the cost of the cement is approximately 20 times that of the equivalent weight of aggregate. It follows that an ideal concrete would contain the minimum of cement and the maximum of aggregate consistent with the qualities desired in this concrete. In order to obtain these qualities, the aggregates must be suspended in the fresh paste, and each particle must be covered by the paste.

Therefore, the ideal consist of aggregates would have the minimum of voids between aggregate particles; but, on the other hand, the large proportion of fine fractions would result in more surfaces to cover, and the reduction in water-cement paste from reducing the voids would be compensated for by the added amount required due to greater surface requirements.

A further factor which enters into this calculation is that of workability. To improve this characteristic of the fresh concrete, either the amount of water or the amount of fine aggregates must be increased; but since the water-to-cement ratio is governed by the desired qualities of the finished concrete, an increase in water results in an increase of the cement to maintain the water-to-cement ratio at the desired figure.

On the other hand, increasing the amount of sand results in an increase in water-cement paste to cover the additional surfaces of the sand particles. Formulas have been established on the basis of actual experience and of the foregoing factors to determine the theoretical proportions of each size fraction of aggregates, the water, and the cement needed to yield a concrete with the physical qualities required.

At this point, economics enters the discussion, since the cost of producing this ideal consist must be considered. Whether the aggregate is natural (rocks disintegrated into sand and gravel by the forces of nature) or manufactured (where man has applied mechanical equipment to disintegrate rocks into crushed stone, manufactured sand, or rock dust), it hardly ever occurs in the size gradation required and therefore must be prepared, or sized, in order to meet specifications. The added cost may at times compel drastic variations from the ideal consist.

In the case of material coarser than 3/8 in., usually defined as coarse aggregate, this sizing can easily be carried out by the use of screening equipment. As a matter of fact, this screening could be extended economically and efficiently to fractions of the fine aggregate in the No. 8 or the No. 10 sieve ranges. But for materials finer than this, the use of wet classification methods, with rare exceptions, is the only solution that we have at present.

A Review of Fundamentals of Classification

First of all, certain conditions as to the behavior of sand-and-water mixtures should be clarified for a better understanding of the discussion that follows.

A perfectly dry sand acts as a mass of finely-divided solids, and although it may flow as a liquid, it comes to rest at a pre-determined angle of repose. As moisture is added to the sand, its behavior changes. It becomes a very contrary solid, due to the fact that a mass of moist sand contains many voids only partially filled with water, and can therefore be compressed and will cake or cement; as a result, moist sand will come to rest at unpredictable angles of repose.

As the amount of water in the mixture is increased, a point is reached where it fills all of the voids, and covers the surface of each grain with a thin film of water. This is the condition commonly called *quicksand*. Because of surface tension, the mixture is a perfect suspension and does not tend to separate. The solids are in a condition called *full teeter*, which means that each grain is free to move, but is unable to do so without colliding with other grains, and as a result stays in place. The mass acts as a viscous liquid with a high specific gravity or density. This mass can be penetrated by solids with a higher specific gravity, which will move at a velocity impeded by the viscosity of the mass.

As the proportion of water increases further, the stability of the suspension disappears, the solid and liquid phases tend to separate, due to their difference in specific gravity, and the sand *settles* out. However, the suspension acts as a liquid with a density and viscosity which can be determined from the proportion and the specific gravities of the components.

By the use of an outside force, usually supplied by a rising current of water, a condition of *teeter* can be created in such a slurry, where this outside force will prevent or retard the separation of the solids and liquids. This condition is called *hindered settling*.

In most cases, however, the solid particles are allowed to separate, although this may be somewhat retarded by currents within the slurry. This condition is called *free settling*.

Classification is the sizing of solid particles by means of settling.

Separation size is the sieve size at which the classification is made.

(*Continued on page* 110)

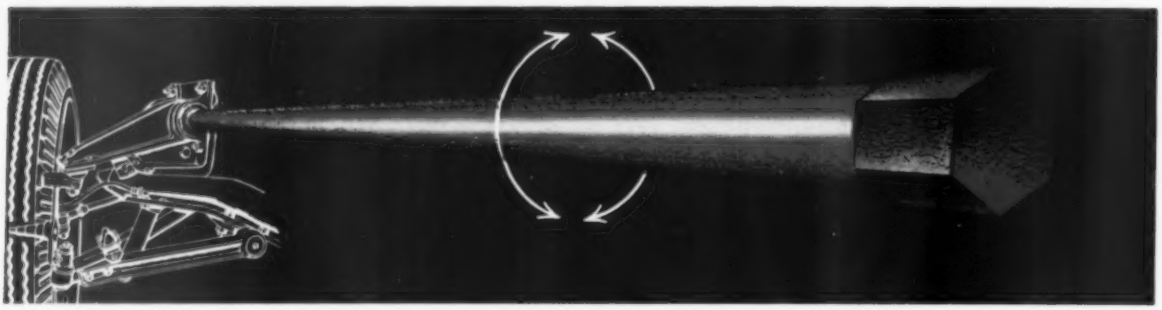
ANNOUNCING

Chevrolet trucks for 1960 with total newness!

Here comes the biggest improvement in trucking in decades . . . a revolutionary improvement that can make any truck route in America a far smoother road to bigger profits for you. Turn the page for the hottest news for truckers since coffee was invented!

new torsion-spring ride!

THE SMOOTHEST THING THAT EVER CAME BETWEEN A ROAD AND A LOAD!



Independent front suspension with tough torsion bar springs . . . for trucks! Years in the making, this totally new suspension system protects everything from bumps and jolts . . . provides a new kind of performance that lengthens truck life, protects cargoes, reduces driver fatigue and cuts maintenance expense to new lows. Independently suspended, each front wheel steps cleanly over bumps. And the friction-free torsion bars work to absorb each jolt or jar; they flex freely, even on the smallest bumps, yet have the capacity to absorb severe shocks. The result is a truck ride so wonderfully smooth that it must be experienced to be believed! And it's now *standard* in *all* classes of 1960 Chevrolet trucks!

Three tailored-to-the-truck rear suspensions complement the revolutionary torsion bar independent front suspension. *In Series 10 and 20 models,* frictionless high-capacity coil springs ease the rear axle over bumps. *In Series 30* and 40 models,* a new two-stage leaf spring provides tailored springing action . . . *and in Series 50, 60, 70 and 80 models,* all-new variable-rate rear suspension gives spring resistance that adjusts automatically to cushion any size load.

**Optional at extra cost.*

Chevrolet trucks for '60

new style, new models!

NEWLY ENGINEERED FOR EXTRA SAVINGS THROUGH EXTRA STRENGTH!

Rolling in on revolutionary torsion springs, these 1960 Chevies are smooth as silk yet tough as nails . . . totally new in scores of profit-boosting ways! In the light-duty class, for example, big new Series 40 chassis-cabs and stakes add to your earning power with G.V.W's up to 14,000 lbs. And virtually every model offers a new lower-to-the-ground build (without sacrificing road clearance) which improves truck stability and makes cab entry easier. In the big-truck class, too, Chevy for '60 sports big-profit G.V.W.'s – up to 19,500 lbs. in middleweights and 36,000 lbs. in heavyweights – with stronger components including new frames with more massive bracing and brawnier side rails, new bigger brakes, and the latest in low-cost V8 or 6-cylinder power.

New Comfort-King Cabs! There's more comfort than ever before, with 5 inches more shoulder room, 6 inches more hip room and more leg room and head room, too! A new wider seat, combining S-wire, coil and flat spring elements, offers a new high in easy riding. And Chevy's new double-walled cowl and new double-panel roof construction provide extra ruggedness and long life.

New custom cabs! Available in all 1960 cab models, they include distinctive exterior door pillar and rear belt line moldings . . . handsome chrome grille (light-duty models) . . . new Super Cushion Seat with foam seat cushion and backrest . . . sunshade, armrest, cigar lighter and control knob trim.

New compact L.C.F. models! Twenty-six new Chevrolet Low Cab Forward models with short cab design allow for maximum length trailers and extra cargo space. Short wheelbase and turning radius give exceptional maneuverability. Bumper-to-back-of-cab dimension is as short as 90 inches. G.V.W.'s go up to 25,000 lbs. and new cab design makes entering easier. And in series 50 and 60 models you can choose 6-cylinder or V8 power.

New tougher built tandems! They're the best built Chevy tandems yet with Hendrickson RT320 rear suspension, two 16,000-lb. Eaton rear axles and 7,000-lb. front suspension (9,000-lb. front suspension optional, extra cost).

And they're POWERED to improve your profit picture, too! Chevy for '60 offers a *wide* choice of better-than-ever power plants; in every weight class you can choose from famous economy 6's or V8's that lead the field for efficient short-stroke design! Three big sixes and four advanced V8's allow you to match the engine to your job for top performance.

Chevy's 1960 trucks with *total newness* are now on display at your Chevrolet dealer's, so stop by sometime soon! . . . Chevrolet Division of General Motors, Detroit 2, Mich.

CHEVROLET

with total newness!

Modern Classification

(*Continued from page* 106)

This separation size, due to the mechanical means employed, is never a knife-edge separation, but the aim of modern classification methods is to approach a clean-cut differentiation.

In classification, the settling is controlled so that the fines or undersize will flow away with a stream of the water or liquid, while the coarse or oversize accumulates in a settled mass. When the stream of liquid flows across the classifying vessel the process is called *surface current classification*; when the stream flows upwards through the vessel and overflows at the top while the oversize accumulates at the bottom of the vessel the process is called *rising current classification*.

Rate of fall is a term to denote the velocity of a particle as it falls through the liquid. Although the rate of fall increases during the time of fall, this variation is so small that the rate of fall is usually considered a constant.

In determining the rate of fall and establishing its laws and formulas, researchers for many years were very much concerned by discrepancies which were revealed at a size of about 0.2 mm. (about No. 70 sieve), a point at which free falling particles reached a "critical velocity of fall and the rate of fall became much slower than it had been for larger sizes." In our jet age we have met somewhat similar discrepancies in aerodynamics, and we can understand better the explanation which Professor Richards offered many years ago, an explanation which still appears to be the most logical one offered, if we can compare it to compressibility of air at the critical speed of sound.

Be it as it may, we are faced with two basic formulas:

1. For particles larger than 0.2 mm.

$R = f\sqrt{2g \cdot \sqrt{D(d_1 - d_2)}}$, where

R = Rate of fall in mm./second

D = Diameter of particle in mm.

d_1 = Specific gravity of the particle

d_2 = Specific gravity of the liquid

f = Frictional factor for the particle, depending not only on its nature, but on its shape

g = Acceleration of gravity (9.8024 meters per second per second)

In the case of round normal quartz grains, the function $f\sqrt{2g}$ has an average value of 87. This is the relationship developed by Rittinger.

2. For particles smaller than 0.2 mm.

As explained by Professor Richards, resistance to fall in a liquid offered to particles of this size is entirely due to viscous resistance of the liquid.

Stokes' equation gives the terminal velocity in these cases, expressed in the same terms as above:

$R = K\ (d_1 - d_2)\ D^2$, where K is a factor, with a value of 424 for quartz.

In Table No. 1 of Figure 1 fractions of a manufactured quartz sand comprised between two sieve sizes were allowed to fall, and the average falling rate was determined and calculated on the average size of particle in the fraction.

In Table No. 2 a natural river sand with the same specific gravity was tested. In this case the maximum and minimum falling rates for each fraction were determined; and the maximum was assigned to the larger particles, the minimum to the smaller ones. Naturally, the shape of the manufactured sand particles and that of the natural sand were quite different. However, the two curves merged near the "critical diameter" or "critical velocity of fall" value.

These falling rates are based on artificial conditions which are remote from actual field conditions since these tests were made at high dilutions, with a low value for d_2; and readings were taken of only one size fraction at a time, while in the field all sizes are represented in varying proportions for each material to be treated.

These formulas serve as a guide in studying classification and settling. It should be borne in mind that the term d_2 applies not to the liquid alone but to the density or specific gravity of the slurry or suspension of sand particles in the liquid. Since in most aggregates the average specific gravity of sand varies but little from that of quartz, a density of 2.65 is used for d_1 and the value of d_2 can be easily calculated from the percentage dilution. The relationship between d_1 and d_2 is a simple one, which is uniform as long as the suspension is uniform. This is probably one of the greatest differences between settling of aggregates and settling of metallic minerals and ores. In the case of the latter the specific gravities of different grains may vary widely according to their nature, and instead of the falling rates indicating different sizes of particles, the concept of *equal falling particles* is introduced: where large particles of light gangue will fall at the same rate as small particles of heavier metallics.

Opposite page: Fig. 1

As mentioned previously, the foregoing applies to *free settling*, but when we reach the conditions of *teeter*, or simulated conditions approaching *full teeter*, the rate of fall is different. This is due to the fact that the slurry has a high density, hence a high viscosity.

Figure 2 (see p. 113) shows the relationship between the calculated *free rate of fall* and calculated *hindered rate of fall*.

Because of varying conditions in a classifier, dependent upon its design, its use of free and hindered settling, many variables are involved which would make theoretical calculation of rates of fall under given conditions so difficult that only a Univac could solve the problem. It has become an accepted procedure to determine experimentally the *actual rates of fall* and to use these in calculating capacities and efficiencies of specific machines. A typical instance is also shown on Figure 2. Engineering know-how enters the picture in interpreting these various elements to determine the adequate machines to do the job required.

These formulas are the basis of all calculations used to explain the separation step of classification. Grouping the various types of separation in the same way as was done in the paper, according to types of settling and directions of stream, the following will be examined:

(*Text continued on page* 113)

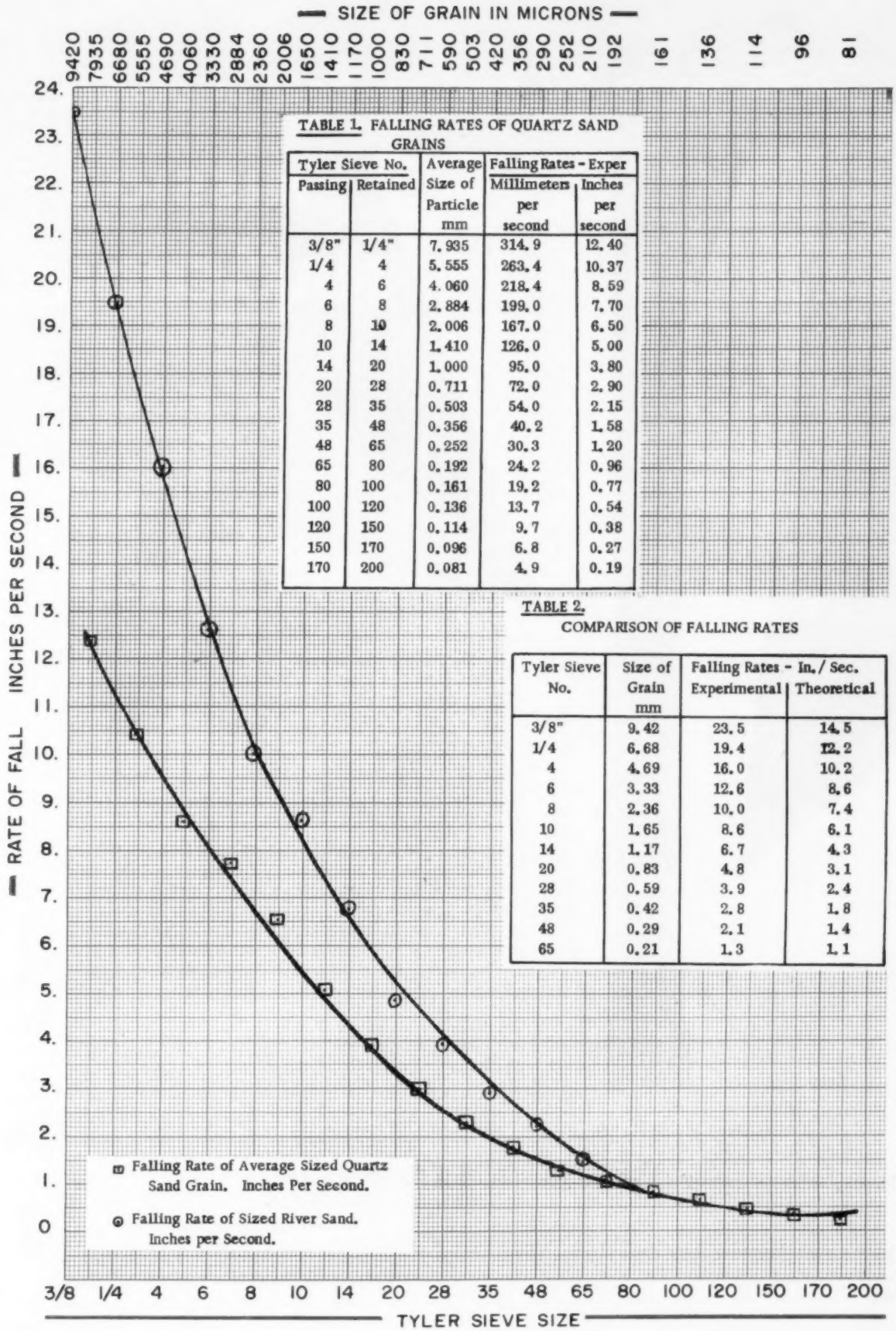


TABLE 1. FALLING RATES OF QUARTZ SAND GRAINS

Tyler Sieve No.		Average Size of Particle mm	Falling Rates - Exper	
Passing	Retained		Millimeters per second	Inches per second
3/8"	1/4"	7.935	314.9	12.40
1/4	4	5.555	263.4	10.37
4	6	4.060	218.4	8.59
6	8	2.884	199.0	7.70
8	10	2.006	167.0	6.50
10	14	1.410	126.0	5.00
14	20	1.000	95.0	3.80
20	28	0.711	72.0	2.90
28	35	0.503	54.0	2.15
35	48	0.356	40.2	1.58
48	65	0.252	30.3	1.20
65	80	0.192	24.2	0.96
80	100	0.161	19.2	0.77
100	120	0.136	13.7	0.54
120	150	0.114	9.7	0.38
150	170	0.096	6.8	0.27
170	200	0.081	4.9	0.19

TABLE 2.
COMPARISON OF FALLING RATES

Tyler Sieve No.	Size of Grain mm	Falling Rates - In./ Sec.	
		Experimental	Theoretical
3/8"	9.42	23.5	14.5
1/4	6.68	19.4	12.2
4	4.69	16.0	10.2
6	3.33	12.6	8.6
8	2.36	10.0	7.4
10	1.65	8.6	6.1
14	1.17	6.7	4.3
20	0.83	4.8	3.1
28	0.59	3.9	2.4
35	0.42	2.8	1.8
48	0.29	2.1	1.4
65	0.21	1.3	1.1

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Modern Classification

(*Text continued from page* 110)

I—Velocity Classification

1. Separation from a surface current
2. Separation from a rising current
3. Separation due to change in direction of surface or rising current

II—Accelerated Settling

III—Hindered Settling

I—Velocity Classification

Separation from Surface Current

Let us consider a condition in which a flow of slurry of Q cubic feet per second enters a tank and leaves it over a weir of length W and of height H, both measured in feet. (Figure 3—see p. 114.) The path of a settling particle is a parabola governed by its falling rate (R) and its velocity (V).

Let us assume for purposes of demonstration that (a) settled solids are removed as soon as they have settled, and that (b) there is a complete absence of eddies, turbulences, and cross-currents.

Then the only solids which will leave the tank in the stream are those which are carried in the stream as it flows over the weir. We can therefore establish a condition in which the length of the tank is such that a particle with a falling rate of R_n would settle out of the stream into the bottom of the tank and thus attain separation from finer particles carried over the weir.

Using the basic Francis Formula for weirs, and applying correction factors for end contraction, for low-head weirs, and providing that H is measured at a distance of 4H from the lip of the weir:

$$H = \sqrt[3]{\left(\frac{Q}{3.56}\right)^2}$$

Theoretically, a particle would have to fall a vertical distance sufficient to be at a depth greater than H from the surface of the current in order to be retained in the tank. However, experimental results have proven that which we all know: layers of liquids do not move independently of those immediately above or below them, and particles within a number of layers of liquid below that at depth H will have, since they are also moving towards the weir, according to the laws of probability, a chance to be entrained over the weir.

(*Turn page*)

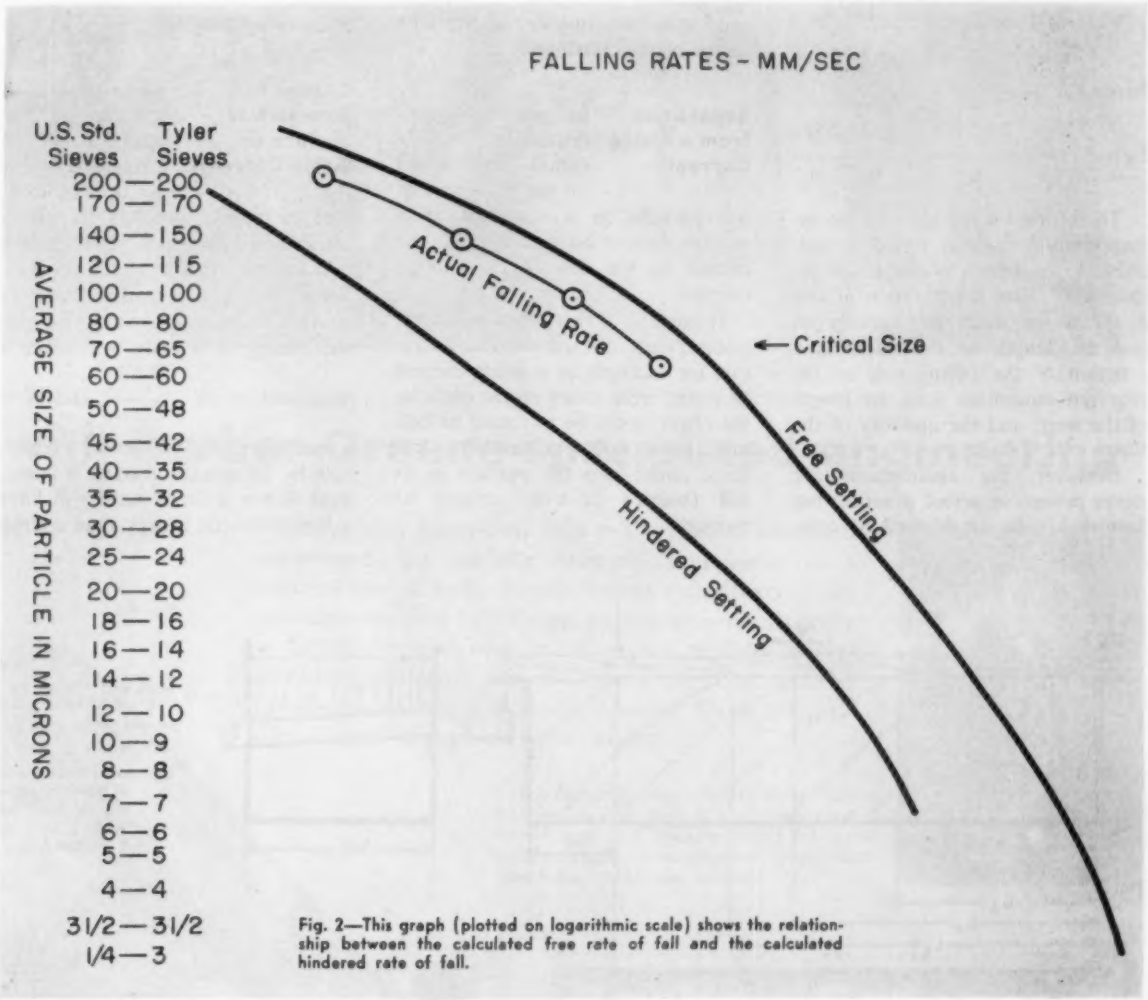

Fig. 2—This graph (plotted on logarithmic scale) shows the relationship between the calculated free rate of fall and the calculated hindered rate of fall.

This chance decreases as the depth of the particle increases, according to the viscosity of the liquid, its velocity, and the size of the particle. So let us once more resort to experimental results which, for classification of sands in the range of ¼ in. to No. 200 sieve at the densities encountered in the field, give a value of 1.9 H to 2.6 H as that at which the probability of a particle being retained is 100 percent.

The velocity of the stream at point of measurement is:

$$V = \frac{Q}{WH}$$

If the particle enters the flume with an initial velocity equal to that of the liquid, the length of horizontal travel before it reaches a point where it will not flow out of the flume is: $L_s = V \cdot T_s$, where T_s is calculated from:

$$T_s = \frac{12 \times 2.6 \times H}{R_s}$$

hence

$$L_s = \frac{Q}{WH} \quad \frac{31.2\,H}{R_s} = \frac{31.2\,Q}{W \quad R_s}$$

Therefore, on the basis of the assumptions previously stated, in calculating the length of the flume required to effect a separation at size S, the height of the weir cancels out and the length of the flume is a function of the falling rate at the required separation size, the length of the weir, and the quantity of the flow.

However, the assumptions are never proven in actual practice; but factors can be established to compensate for the fact that operational practice differs from theory:

1. Although every effort is made in designing the feed to the classifier with a minimum initial velocity of the entering slurry, because of the difference in inertia between the liquid and the particles, the latter will have an additional travel downstream which can be incorporated into the calculation of length of horizontal travel before separation.

2. Every effort is made in designing the feed entry, the tank, and the flow of the surface current to avoid eddies, turbulences, and cross-currents, but this is difficult to attain under the best of circumstances; and only experimentation with the actual machine, under operating conditions, will bring to light the efficiency of the design.

3. The removal of settled solids from the settling pool is the phase of classification which has caused the greatest divergence of design, and, as a consequence, of the efficiency of the classifiers.

Separation from a Rising Current In the foregoing discussion classification was based on the trajectory of the particle as a resultant of a motion caused by gravity and one caused by the flow of the surface current.

If, instead of this horizontal component, an upward vertical force, due for example to a rising current of water, were to act on the particle, the effect would be to retard its fall; and, given sufficient intensity, this force could stop the particle in its fall (teeter) or even reverse its motion.

As the intensity of this force increases, the rate of fall decreases and would pass through the "crucial velocity," and the rate of fall would then be measured by Stokes' Law, irrespective of the size of the particle. However, there are certain qualifications to this apparently simple theory before it can apply in the field:

1. The rising current should be as nearly uniform as possible to be used effectively in classification.

2. Where the surface current is deflected and thus becomes a rising current, there is no change in the density of the slurry (d_2). Settling due to changes in direction or velocities of the current will be considered later. However, when the rising current requires an outside source of water (commonly denoted as hydraulic water), the extra dilution will lower the value of d_2.

3. Turbulences and eddies will reduce the effectiveness of the action of the rising current.

Change in Direction of Surface or Rising Currents This phase of settling and its application to classification is not often considered in theory, although its effects are known in practice. Perhaps the best known example is the segregation in the sand bars in a river bed, or on a river curve. Since the kinetic energy of a body in motion is measured by $\frac{1}{2} \frac{WV^2}{g}$, and W is a function of the volume of the particle by its specific gravity, it is evident that a grain of sand will have a higher kinetic energy than a drop

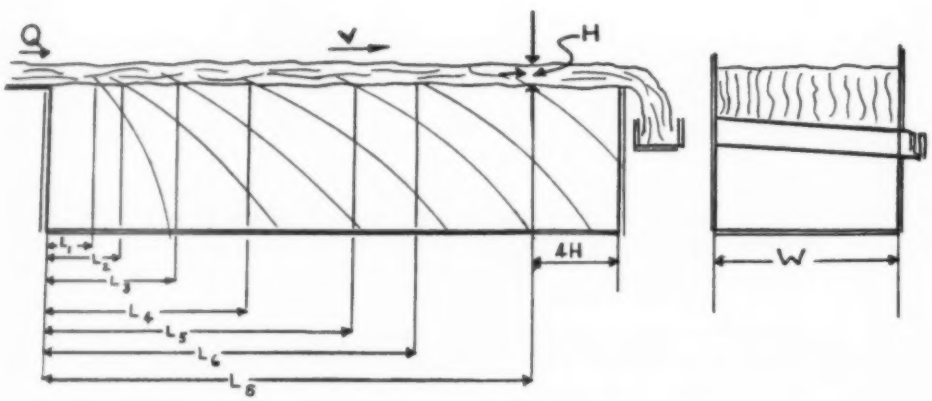

Fig. 4

Q = Quantity of slurry in cu. ft./sec.
H — Height of weir
W = Width of weir
L = Length of travel of settled particle in feet for settling rate of R (inches/sec.)

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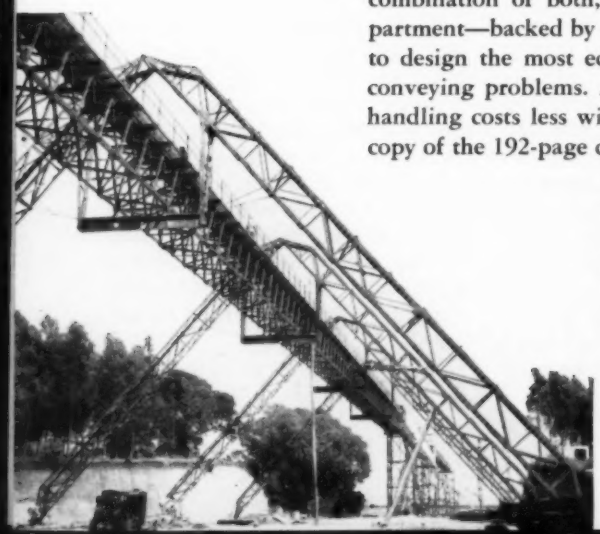

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of water of equivalent size while both of them are traveling in the same stream of slurry.

If the direction of this stream is changed, or if it is brought to a stop, the energy in the particle of sand will be greater than that of the water and it will have a tendency to follow the original path; or if it is deflected, its angle of deflection will be different from that of the water. This principle is used in baffling to reduce the speed of a surface current in a settling tank; but in view of the uncertainty of the deflected path of the solid, it is not commonly used as a means of classification.

Actually, most classifiers in use at present use not one but a combination of the methods of classification discussed. The design of the devices used and the direction of flow of the slurries enter into account in establishing the proportion in which these methods are combined, and it is accepted that experimental determinations of the actual rate of fall will serve to establish capacity and efficiency data.

II—Accelerated Settling

This newer method of classification, since its use in the aggregate industry is very recent, uses the hydraulic cyclone. Its cousin, the dry cyclone, has been in use for classification in the nonmetallic industries for a number of years.

In aggregate applications, because of the conditions that prevail, the calculations are not as complex as in metallurgical applications. Here, too, it is a question of velocity separation, and the same formulas can be used. Since the principle of the cyclone is that of a rapidly whirling mass, there will be no question of the "critical velocity," and we remain within the limits of Rittinger's Formula, irrespective of the size of the particles. To clarify the problem, however, let us separate the action into its two component phases:

a) Separation of particles of different sizes—The Rittinger Formula, as explained above, is expressed as follows:

$$R = f\sqrt{2g} \cdot \sqrt{(d_1 - d_2)\,D}$$

In other words, in the case of a free falling particle, it is only the force of gravity, expressed by the acceleration of gravity "g," which causes the motion denoted by the rate of fall R. If the slurry were caused to rotate at extremely high speeds within the confines of a cylinder, centrifugal force would cause the particles to move towards the walls of the cylinder. This force is expressed as a function of the square of the velocity of rotation. All other factors remaining equal, the rate of the displacement thus caused could then be measured in much the same way as the rate of fall with the substitution of the many "g's," resulting from this centrifugal force, for the single "g" of gravity.

Thus, as soon as the slurry starts to revolve, classification dependent upon the diameter of the particles (since their specific gravity is essentially the same at all sizes), and the specific gravity of the liquid phase (hence its viscosity or resistance to this displacement), would occur. The coarse particles would report to the outermost layer, and the finer particles in successive layers, according to size, towards the center, by the mere fact of displacement by the heavier and larger particles. (Figure 4)

b) *Recovery of the sized particles*—Many methods have been attempted to separate the different layers of particles according to a predetermined pattern, but none proved really effective until recently. The successful method consists in "skimming" out of the revolving mass those layers of liquid, and of liquid and particles, gradually increasing in size as their distance from the central axis increases, that are to be rejected. This is done by means of the vortex finder. The remainder of the mass finds its way out through the apex valve, which has a certain amount of regulation to increase the volume of material in the cyclone and thus force more solid particles into the vortex finder.

There is, therefore, a definite relationship between the three openings: the feed entry, the vortex finder, and the apex valve, which will govern the efficiency of the cyclone. The relative size of the vortex finder and of the feed entry will, in turn, govern the diameter of the cyclone.

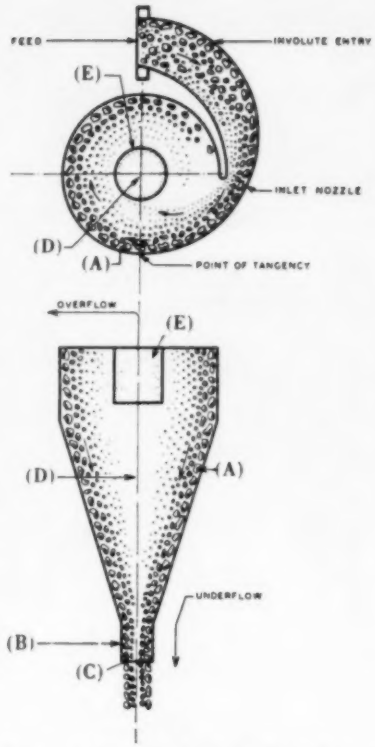


Fig. 4—A diagram of a hydraulic cyclone, showing classification and flow of materials.

III—Hindered Settling

Because of the high density and viscosity of the slurry through which a particle must fall in a separation by hindered settling, the rate of fall is governed entirely by Rittinger's Formula:

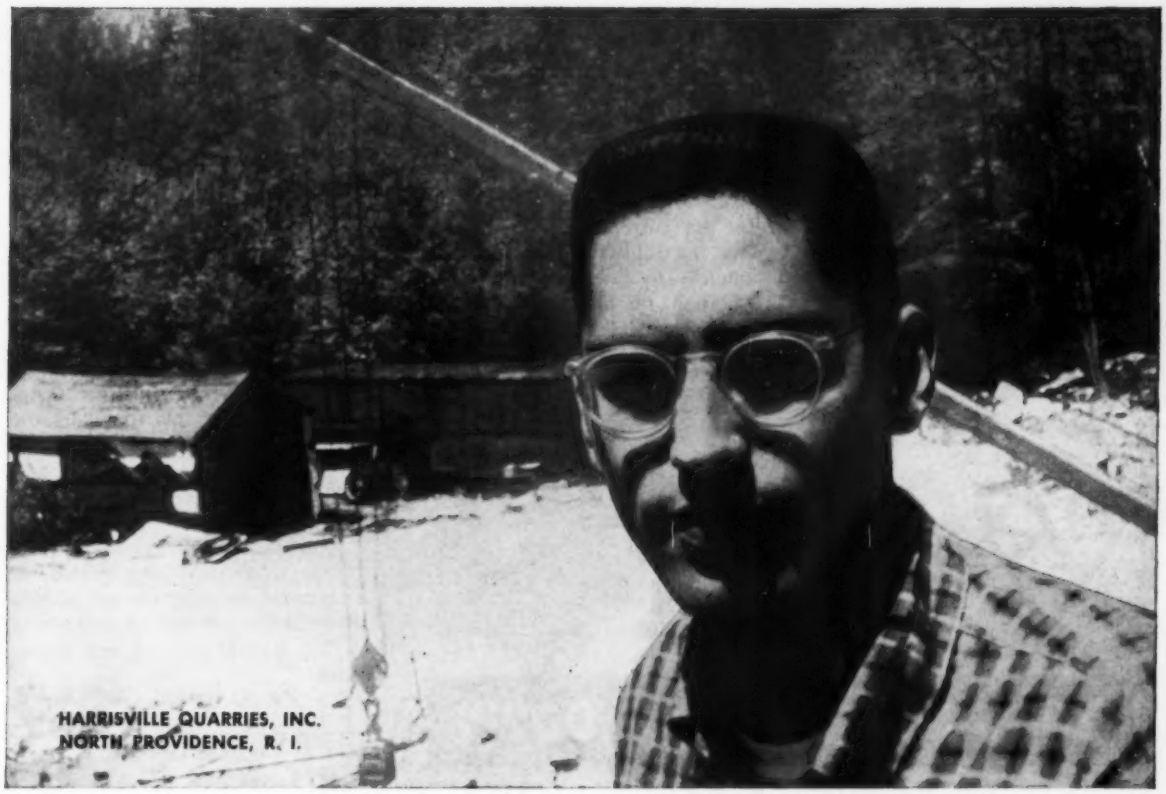
$$R = f\sqrt{2g} \cdot \sqrt{D\,(d_1 - d_2)}$$

In the case of aggregates, d_1 usually has a value close to 2.65, and the maximum value of d_2 has been found to be 1.5, equivalent to approximately 54 percent solids.

The comparison between free settling and hindered settling falling rates was shown in Figure 2.

In order that this formula may apply to the entire travel of a particle, and also to all particles of equal diameter D, it is important that the d_2 be the same at all points of the teeter column, whether this be in cross-section area or in height of the column. In order to obtain this result, two conditions must be satisfied:

a) The particles in teeter should be concentrated so that the re-



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quired specific gravity, or density, is obtained with the minimum of retention in the vessel. This is usually done by tapering the cross-section of the vessel into a throat.

b) If conditions of *full teeter,* that is, of the ideal quicksand, were attained, the size of the particles in teeter would govern that of the particles which sink through the separating column; this would be an impossible situation, since it would mean continuous classification and removal of oversize from the column. Therefore a condition of teeter is established by the use of a rising current of water, whose velocity can be regulated so that the rate of fall of particles at the separating size is positive, while it is a negative value for smaller particles. But this current must be dispersed over the full cross section of the column to obtain homogenous conditions throughout.

A further complication which must be taken into account is that of the presence of dispersed slimes, which would increase the specific gravity of the liquid portion of the slurry and thus raise the value of d_2 still further above the experimental maximum of 1.5. This is usually prevented by a preliminary washing and desliming of the aggregates.

Finally, the amount of water introduced into the teeter column will dilute the slurry and reduce the value of d_2; by increasing the pressure or the velocity of the rising current it is possible to obtain the same effect with less dilution; therefore, this pressure must be closely regulated.

When materials of heavier specific gravities or with greater specific gravity differentials are treated, as in mineral dressing, the use of hindered settling is not as difficult as in the classification of fine aggregates.

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Talc, Soapstone, Pyrophyllite Show Production Increase

Domestic mine production of talc, soapstone, and pyrophyllite increased 8 percent in 1958, compared with 1957, and approached the record high of 1956, according to reports by producers to the U.S. Bureau of Mines. Sales of these commodities by producers in 1958, however, remained virtually unchanged.

New York, California, and North Carolina ranked first, second, and third, respectively, in the quantity of talc, soapstone, and pyrophyllite produced in 1958, a position maintained since 1951. North Carolina continued as the major pyrophyllite-producing state, followed by Pennsylvania (sericite schist) and California.

Total imports for consumption of talc, soapstone, and pyrophyllite increased 12 percent in quantity and value in 1958, compared with 1957. Exports of these commodities in 1958 rose to a new high.

Estimated world production of talc, soapstone, and pyrophyllite in 1958 reached 2,000,000 short tons for the second successive year as quantity increases, primarily in the United States and Italy, offset the decrease reported in Japan.

Processing research initiated in new Allis-Chalmers plant

Grate-Kiln studies involve wide range of materials

WHEN a new process pilot plant went on stream recently at Carrollville, Wis., it began to provide pertinent data on many problems concerning agglomeration, heat treatment, and processing of a wide range of raw materials. As the heart of a $250,000 research facility, the plant was built by Allis-Chalmers to study and evaluate, on both a process and an economic basis, such materials as cement, phosphate ores, dolomite, limestone, plus others.

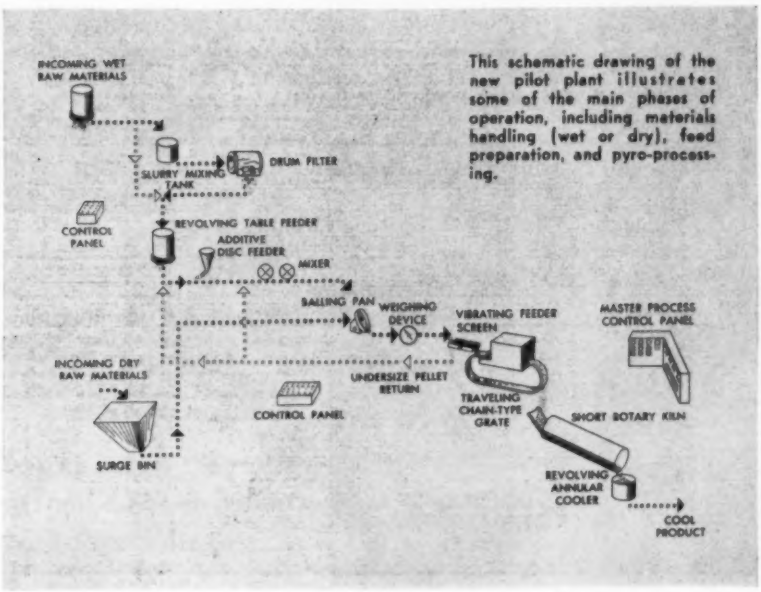
To assure completeness and accuracy of the information obtained, the unit was designed with peak efficiency and versatility as primary goals. Its operations are carried out with the precision expected from any competent research and test laboratory.

A completely instrumental model of the double-pass Grate-Kiln system is at the heart of the installation, and it is being used by development engineers for three major considerations:

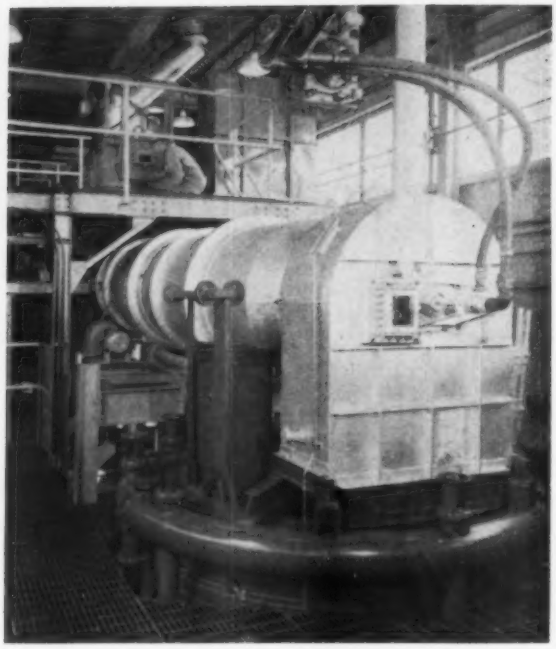
1. To demonstrate the feasibility of agglomeration (pelletizing) processes applied to many different materials.
2. To determine variations in operating conditions.
3. To develop and study techniques required in handling, preparing, and processing the test materials.

These detailed studies are conducted on multi-ton samples of minerals and ore concentrates furnished by operations of various industries throughout the Western Hemisphere, and also some in Europe and Asia. The research investigations with the 1/50th scale equipment at Carrollville will aid in establishing the most efficient design of systems and components to be incorporated in full-scale production equipment.

As an example, the pilot plant was designed completely and flexibly to duplicate operational-type materials handling, filtering, and blending of raw materials, feed of wet or dry materials, weighing, product cooling (and heat recovery), proportioning of additives, and pelletizing of feed prior to processing it in a combination of chain-type traveling grate and short rotary kiln.



This schematic drawing of the new pilot plant illustrates some of the main phases of operation, including materials handling (wet or dry), feed preparation, and pyro-processing.



Above: Feed for the grate and following kiln is processed in the balling pan, left. From the control console, right, variations in pellets are achieved. At far left are flow meters for control of moisture addition.

The pilot plant's rotary kiln completes the pyro-processing of pellets preheated in the traveling grate. Material discharged from the kiln enters the annular cooler below the firing hood. Heat recovered in the cooler contributes to the system's efficiency.

The operational and process information obtained is recorded for study and interpretation by engineers of both a company interested in processing a material and those of the Allis-Chalmers staff.

Among the various nonmetallic minerals and compounds on which informative studies have been conducted with the Grate-Kiln equipment are phosphate, cement, lime, and deadburned dolomite.

The preparation of phosphate pellets for shipment to electric arc furnaces has been one of the processes satisfactorily accomplished in the pilot plant. Hard durable pellets of this type are regarded as an aid to production of elemental phosphorus since a uniformly-sized, high-porosity furnace feed is conducive to rapid reduction to the elemental material.

In cement manufacture, the Grate-Kiln system has already been used commercially in both foreign and domestic installations. All of the latter have involved the dry process. However, due to the amenability of raw materials in some areas to the wet process, Allis-Chalmers development engineers are now projecting studies involving this process.

In addition to evaluating this production method, the Carrollville plant will also be involved in research on control of alkalis in cement clinker produced from raw material of high alkali content.

The combination of a traveling grate and rotary kiln has also been found to have certain advantages in the production of lime and deadburned dolomite. As an effective preheater and heat recovery unit, the grate section is described as making a substantial contribution to operating economy, and as a prime factor in reducing dust loss, as compared with conventional processing equipment.

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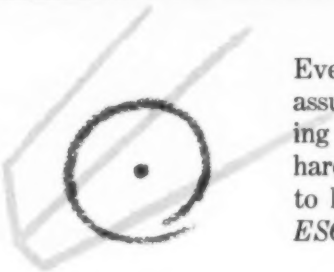
RIGID QUALITY CONTROL TESTS ASSURE TOUGHNESS, HARDNESS



Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

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You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

ESCO Points and Adapters for all digging equipment

Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

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Shortening Quarry Haul Effects Operating Economy

OPERATING economies at the 800,000-bbl. Inkom, Idaho, plant of the Idaho Portland Cement Company have been the direct result of the installation of an overland belt conveyor, which materially reduces the distance of quarry truck hauls. The conveyor, 825 ft. long, ties in a new crushing and screening plant which has been set up near the quarry with storage facilities at the Inkom mill.

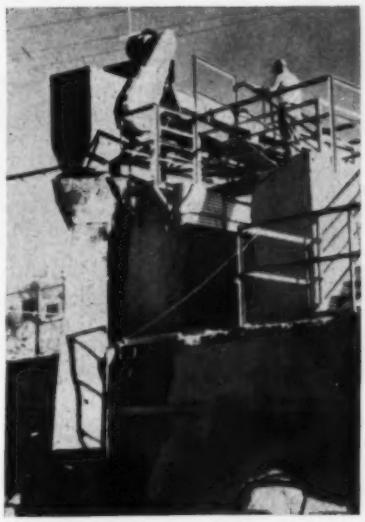
At many operations, a reduction of 825 ft. in truck haul would seem inconsequential, but the savings effected at the Inkom plant amounts to 50 percent of the former haul distance from the quarry—a significant point in view of the fact that material-handling efficiency is a critical factor in maintaining a satisfactory profit margin.

The new crushing and screening plant and the overland belt conveyor produce two primary savings. In reducing the truck haul distance, this conveyor, supplied by Link-Belt, enables quarry trucks to make more round trips per shift from the quarry to the crusher. With the new crushing and screening equipment, a smaller-size product can now be fed to the ball mills, increasing their capacity and reducing maintenance.

Limestone used by the Idaho Portland Cement mill comes from two sources nearby. One of these is a deposit on a hillside approximately 700 ft. from the crushing and screening building; the second is a railroad ballast plant nearby, owned by a contractor.

This secondary source of supply works to the mutual advantage of both the cement manufacturer and the contracting firm. Undersize ballast material is ideally suited and sized for the needs of the Inkom plant. It can be fed directly to mill storage on the overland belt conveyor without further crushing or screening. Thus, the cement mill saves on these costs, and the contracting firm has an outlet for material too small for ballast needs.

Prior to the installation of the new equipment, limestone was hauled from the face of the quarry to a crushing and screening plant near the present storage bin. When plans were formed for the erection of a new crushing and screening installation, the decision was made to locate it nearer the quarry, and to feed sized limestone to the plant by an overland belt conveyor.



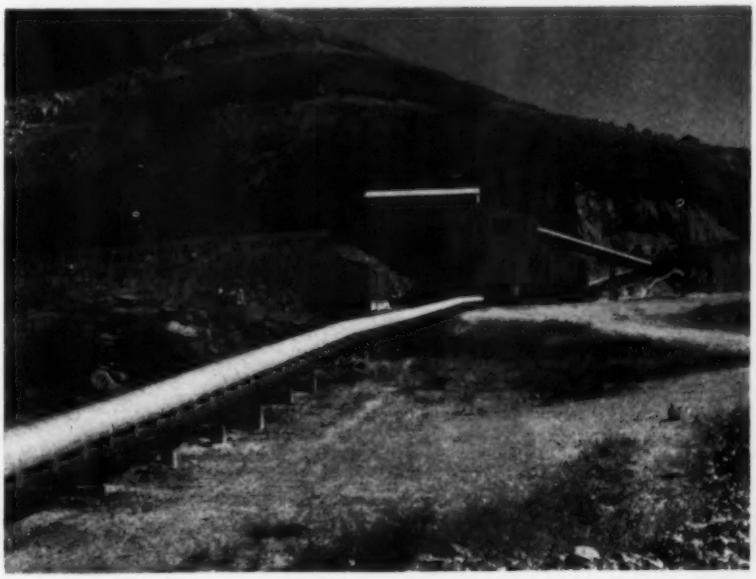
The swiveling chute installed on the discharge end of the overland belt conveyor can be positioned to permit uniform stockpiling of limestone in the storage bin.

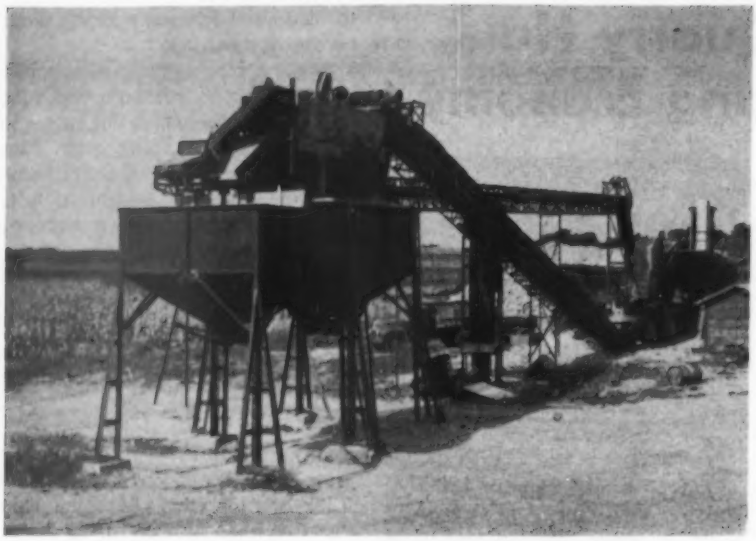
The quarry-run stone is dumped into a truck hopper equipped with an apron feeder, which discharges to a Link-Belt BA scalping screen. Plus 6-in. material is scalped for crushing in a jaw crusher, and minus 6-in. goes to a hammermill for reduction to minus ¾-in. size. Material discharged from both the jaw crusher and hammermill is collected by an inclined 30-in. wide belt, carried to a transfer tower, and chuted onto another inclined belt which returns it to the crushing and screening building in closed circuit.

Returned material then passes over a double-deck, heavy-duty Link-Belt VA vibrating screen. Here the top plate screens off 2½- and 3-in. material, and the bottom deck removes minus ½-in. stone. Oversize is chuted to the hammermill for a second pass.

The horizontal overland conveyor, 20 in. wide, carries minus ¾-in. limestone to the mill storage bin. This belt operates at 300 f.p.m. and handles 150 t.p.h. Corrugated galvanized steel covers protect the belt except at the point where it passes under a country road in a concrete tunnel. The discharge end has a swiveling chute which can be positioned to bed the crushed limestone evenly.

Limestone is blasted from a hill behind the crushing and screening building, and hauled to the crusher in quarry trucks. After crushing and screening, the minus ¾-in. limestone is carried to cement mill storage on the conveyor belt in the foreground.





Small

Young

By **BUREN C. HEROD**

Above: Six years ago, the Northwest Limestone Co. plant consisted of a primary crusher, a screen, bins, and two conveyors. The crusher handled both plant feed and screen oversize. Capacity was a nominal 100 t.p.h.

Left: Today the operation has 100 percent more capacity, achieved through the addition of a second screen, used as a scalper, and a secondary crusher; these units have eliminated a circulating load on the primary.

The original quarry equipment was replaced with larger capacity machines, including this 1½-cu. yd. shovel, and a 3-in. self-propelled drill.

firm—competent producer

organization boosts market position with doubled capacity

SIX years ago, Northwest Limestone Company, Fort Dodge, Iowa, was organized by a group of three brothers who erected a modest crushed stone plant with a peak capacity of about 100 t.p.h. Despite a lack of experience in this field, the Yates brothers pooled talents, resources, and energy to develop an efficient small operation and business that would offset slump periods encountered in earthmoving, their former activity. (See PIT AND QUARRY, Nov. 1954, p. 107.)

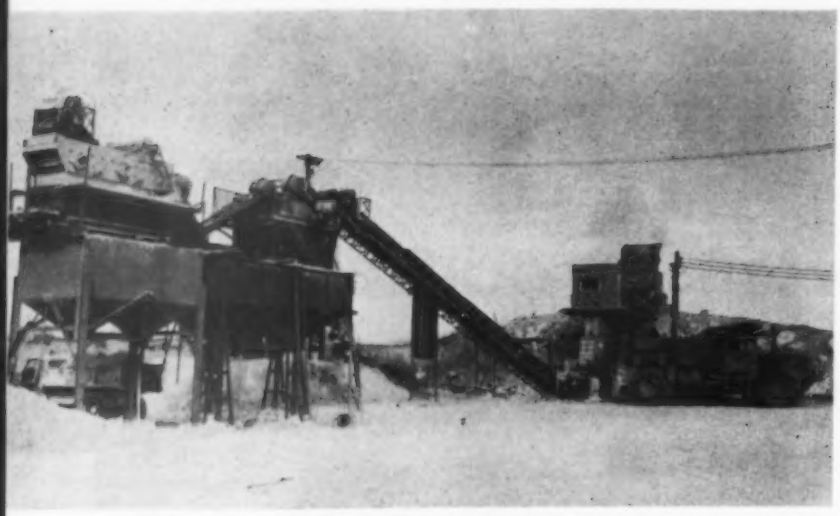
Today, through modification and addition of equipment, the plant has a capacity 100 percent greater than when built—not a giant of the industry perhaps, but one that reflects an outstanding effort for any individual operation. Now, as earlier, the operation's products consist primarily of road stone, concrete aggregate, chips, and aglime. However, that similarity to the original setup terminates with respect to the production phases.

The need for greater capacity to meet demands, plus increased operating experience on the part of the owners, formed the background for changes or additions made to every step from quarrying to stockpiling. For the following operations, equipment of larger capacity was acquired to replace the original units used—drilling, quarry loading, quarry-plant haulage, and stockpile rehandling. The plant proper was expanded, and flexibility of flow was increased through the addition of another screen and a secondary crusher.

Although earth-moving experience preceded the Yates brothers' entry

Right: Controls for the motors in the plant are housed in the operator's booth above the primary crusher.

This view of the quarry shows the thin overburden above the deposit, background, and the excellent breakage achieved in blasting, center.



The original screen, left, is now a finishing unit; and the second screen scalps oversize from the primary crusher-run material for feed to the secondary crusher.

in the crushed stone business, thin overburden was a prime factor considered in their search for a site to develop a quarry. Located a few miles northwest of Fort Dodge, the leased tract acquired in 1952 contains a deposit of top-quality, evenly-bedded limestone overlain by shale and soil averaging only 8 ft. in thickness. This deposit has also been worked underground in the Fort Dodge area for several years by other operators.

The low overburden on this firm's property was favorable both physically and with respect to initial costs in getting the operation under way. It has since been an important element in maintaining the beneficial overall ratio of production rate to equipment investment which the company enjoys.

Stripping is handled by the ¾-cu. yd. Northwest shovel originally assigned to the quarry. It is hauled to spoil areas by the two older quarry trucks. On the cleared surface of the stone formation, a DH99 Gardner-Denver Air-Trac sinks 3-in. blastholes to establish a 20-ft. face. About 80 holes are drilled for a shot, for example, on a 4- by 6-ft. spacing. The holes are charged with pre-mixed Du Pont Nylite above a bottom stick of dynamite. One blasting cap is used per hole, and it is attached to the bottom stick. When water is encountered in the holes, nitrate is replaced with dynamite.

The yield from blasting has averaged about 3.7 tons of rock per pound of explosive. As can be seen in an accompanying photograph, an excellent breakage is realized. This is due in considerable part to the bedding and jointing characteristics of the formation, as well as to drilling and blasting methods. At its optimum, the breakage furnishes a significant boost to the production rate—hourly output climbs nearly 20 percent when the feed consists of well-broken quarry-run material.

This material is now loaded out by a 1½-cu. yd. Model 6 Northwest shovel and hauled to the plant hopper by the larger, recently-acquired quarry trucks — a pair of 15-ton Eucs, and a 22-ton Dart, all rear-dump units. Two of these are normally in operation, with the third as a standby.

As originally installed, the plant consisted of a 3030 double-impeller Cedarapids primary crusher, a 4- by 12-ft. triple-deck Cedarapids screen mounted above a set of Pioneer bins, plus screen feed and crusher return conveyors. Equipment since added includes the secondary crusher—a 5XD Gruendler hammermill, a Hewitt-Robins Eliptex screen, another set of bins, and appropriate conveyor sections.

From the dump hopper, the plant feed is transferred on a 36-in. by 12-ft. Pioneer apron feeder to the primary crusher. Driven by a pair of 75-hp. Century motors, the primary is generally set for reduction to ¾-in. maximum. However, the breaker bars are opened up to provide a coarser crusher-run when needed.

Discharge from the primary is transported on a 30-in. by 85-ft. conveyor to the Eliptex screen. This screen, utilized as a single-deck scalper, is fitted with ¾- or 1½-in. hexagonal opening Weirco cloth, depending on the top size of finished

With the installation of the 250-hp. hammermill secondary seen here, the primary can now operate without a return load.

products desired. Scalper throughs drop into an underlying 21-cu. yd. bin, and the oversize is chuted to a 20-in. by 50-ft. conveyor for transport to the secondary crusher.

The latter, driven by a 250-hp. motor, discharges to an 18-in. by 75-ft. conveyor on which the product is carried to the final screen. Screencloth on this triple-deck unit, the original screen in the plant, is varied in accordance with product sizes in demand. For illustration, it may have ¾-in., ¼-in., and 8-mesh openings on the top, middle, and bottom decks, respectively.

The top deck retained fraction is chuted to the same belt on which the scalper oversize is conveyed to the hammermill. Each of the three remaining fractions separated on the final screen is chuted to the appropriate underlying bin compartment.

Finished products are drawn from all bins for direct shipment or for transfer to the stockpile area. Loading from stockpile is handled by a Michigan 75A tractor-shovel. Company-owned trucks—two 1958 tilt-cab Fords, and an older model, and also customers' units, are weighed out over a Fairbanks-Morse scale.

Agricultural limestone produced by Northwest is delivered to points up to 50 miles from Fort Dodge. Other products, from 1½-in. road stone to chips, are hauled to customers throughout Webster County and into adjoining areas.

Operations of this vigorous newcomer to the industry are handled by a 5-man crew including John. C. A., and Lloyd Yates. A sister, Mrs. Joyce George, runs the office. The office and scalehouse, originally housed in an old garage, have been established in new quarters. A Quonset-type shop building was also erected to accommodate maintenance of trucks and plant equipment.

One of the firm's own delivery units. Consignments are made throughout the county and into adjacent areas.

Three of the family group heading Northwest Limestone operations. At left and right, Nick and John Yates, and their sister, Mrs. Joyce George.

Research, Engineering Building Slated for Huron Portland

Plans have been announced for the construction of a 24,000-sq. ft. laboratory and engineering building at the Alpena, Mich., mill of the Huron Portland Cement Company. Construction is to start early this fall, with completion scheduled for the spring of 1960.

First major structure to rise on the property since 1918, the new concrete, steel, and glass building will house the engineering, laboratory and personnel departments. These are now in the office building which was constructed in 1918, and remodeled at intervals.

Increased production, expanded quality control tests, and overcrowded conditions due to increased personnel have put an overwhelming burden on laboratory facilities, necessitating the new building.

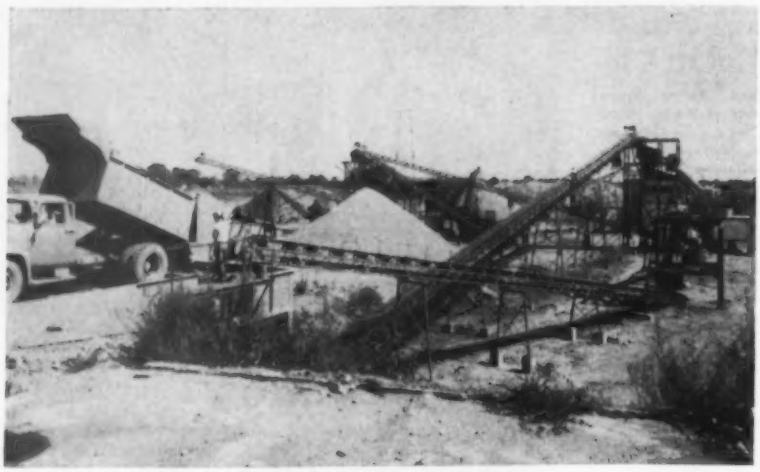
In addition to the testing equipment now in use, the new laboratory will have space for research, X-ray diffraction and a library. The building was designed by Harry Fleischer, New York City, a firm specializing in designing cement laboratories.

Directors of Pan American Sulphur Co. have declared a third quarterly cash dividend of 25 cents per share.

500 T.P.H. Crushing Plant Opened by Rowe Construction

The Milton, Vt., limestone crushing of the Rowe Construction Company, Walton, Mass., recently went into full operation with a peak capacity of about 500 t.p.h. Ransome Rowe, president of the company, estimates that the Milton deposit contains approximately 1,500,000 tons of limestone.

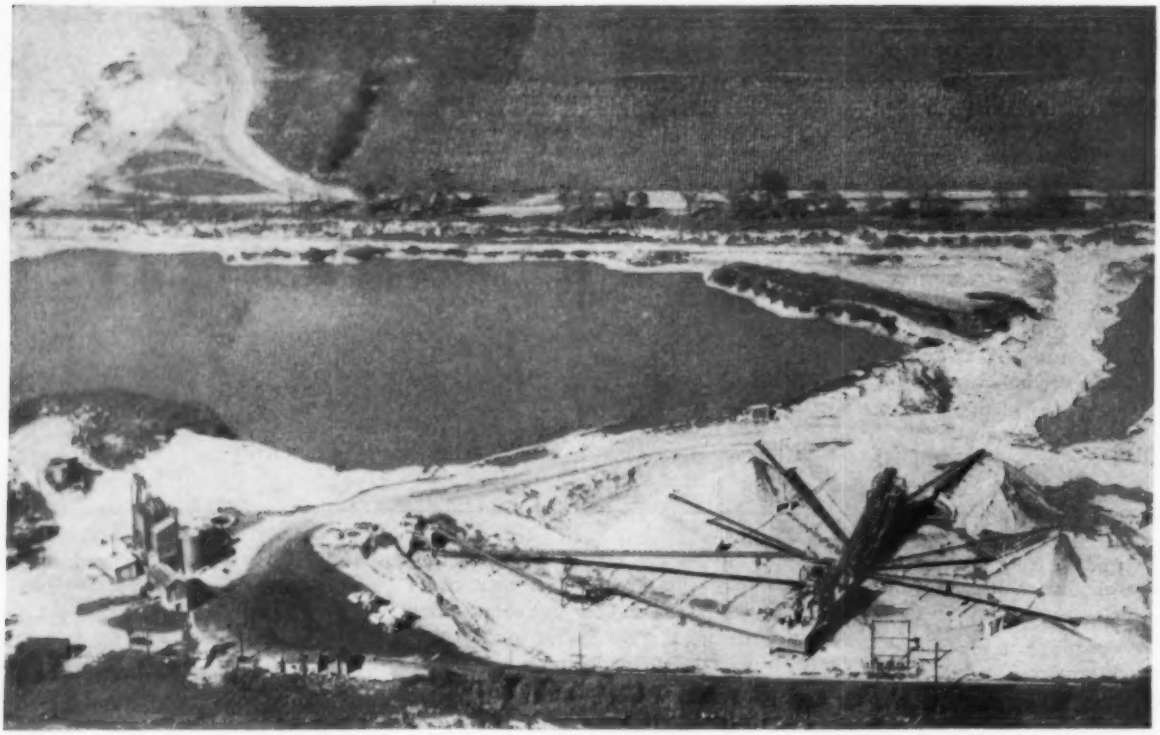
According to Mr. Rowe, the firm had orders for 200,000 tons of crushed rock before the plant went into production. He indicated that another large limestone deposit in the area would be tapped when the present supply runs out.



A truck dumping to the hopper. At the right is the crushing department and equipment for making special products. In the background (center) is the screening tower.

Arrow's

By WALTER E. TRAUFFER



An aerial view of Arrow Sand & Gravel Company's new plant in Columbus, Ohio, showing the stacking conveyors, one radial. At the left are the truck hopper and the company's ready-mix plant. A part of the pit is visible in the left background.

New Gravel Plant

eliminates objectionable features of operation it replaces

THE new 250-t.p.h. plant of the Arrow Sand and Gravel Company near Columbus, Ohio, is a good example of intelligent design in a medium-sized plant. It replaced the company's old Grandview Ave. plant in the northwest part of the city, just east of the Olentangy River. This plant also had a capacity of 250 t.p.h. but recently ran out of material. Now at this old location there is only one of the company's five ready-mixed concrete plants. There is also one at the new plant site. Most of the sand and gravel output has always been used in these plants, with their 40 truck mixers, and any excess is sold, mainly to other ready-mix operators.

The new Franklin plant is located on State Route No. 104, about a mile south of the Columbus city limits, in the area from which most of the city's aggregates now come. Construction was started in September, 1956, and the plant was in operation in April, 1957.

In designing this plant flexibility was stressed, not only to facilitate adjustment to this particular deposit, but also to take care of future variations in the deposit and in materials specifications. Great care was taken to eliminate some of the objectionable features of the old operation.

For example, ground stockpiles are used instead of the bins, which caused a wide variation in the water content of the products going into ready-mix. The ground stockpiles keep the moisture content both lower and steadier than the bins, and they are also preferred to piles with tunnel recovery.

Wash water pressure at the old plant was too low for best results, but the pressure in the new plant is 80 to 90 lb. at the screens. The old plant consisted of several closed buildings; the new one is the open conveyor type now almost standard. Flexibility is such that it is seldom necessary to change screen cloth sizes or make crusher opening adjustments. Only eight men are required to operate this plant, including the pit and trucks, compared to 25 at the old plant of equal capacity.

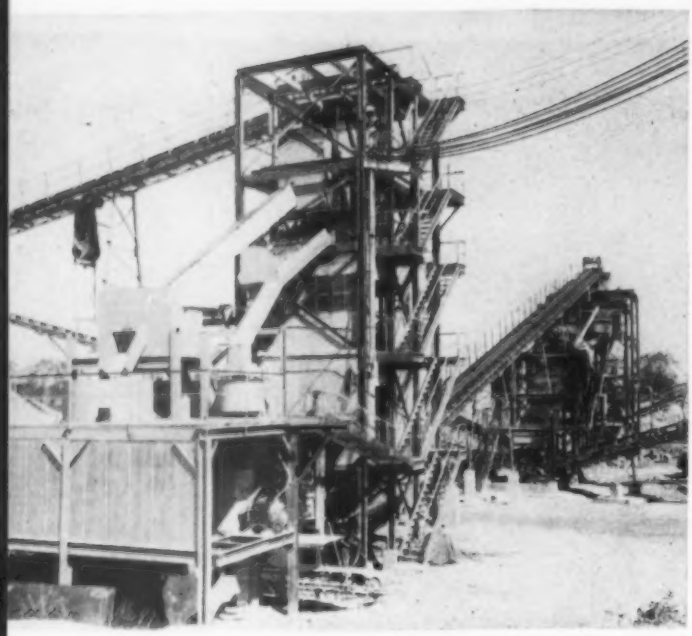
After the plant got into operation, it became necessary to make a few adjustments and changes. For example, the sand was found to run consistently low in minus 50-mesh; this problem was solved by the installation of a Whirlcone. Fine sand from a pocket in the deposit also helped.

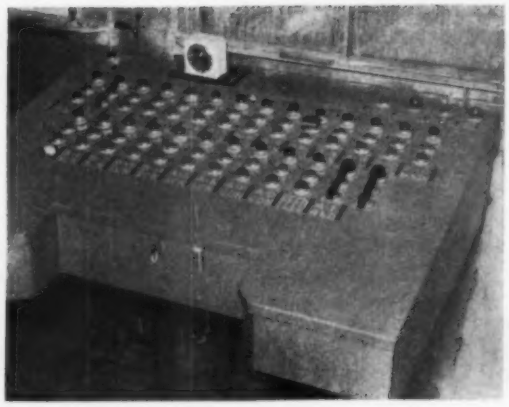
The river bed deposit varies from 40 percent sand and 60 percent gravel to 20-80. There is much coarse gravel in places but everything over 10 in. is scalped out. At times, over 50 percent of the gravel is over 1¾ in., which is the largest size produced. A flexible flowsheet and ample crushing capacity were the only logical solutions.

The deposit averages about 12 ft. above water level and from 12 to 20 ft. below. Digging is done with a Manitowoc Model 3900 Speedcrane dragline with an 80-ft. boom and a 3-cu. yd. Hendrix perforated bucket. It is powered by a Cummins diesel engine. Hauling to the plant, about ½ mile one way, is done by three 12-ton capacity tandem trucks. When operations are in a coarse-sand area, each truck stops at a sand pile en route, where some fine sand is added to the load by a 1-cu. yd. Lima crane. This pile is built up from oversanded areas.

At the plant the material is dumped through a 10-in. rail grizzly into a 50-ton Erie steel hopper. A McLanahan & Stone reciprocating plate feeder discharges on a 30-in. by 280-ft. belt conveyor (No. 1) to the top of the scalping station. There an Allis-Chalmers 5- by 10-ft. Ripl-Flo single-deck screen (No. 5), with 2½-in. square perforated plate, scalps oversize to a 10-in. Allis-Chalmers Superior McCully gyratory crusher. This reduces to 2-in. minus. A second crusher is kept in reserve in case of a breakdown or overload.

Minus 2½-in. gravel through this screen goes to a 6- by 14-ft. Ripl-Flo 2-deck screen (No. 6) with 1¾- and ⅞-in. wire cloth. Oversize goes





Above: The control board for the entire plant is in a room over the plant. Note that the circuit for a special product is temporarily taped over.

At the scalping tower two coarse crushers (one in reserve) are at the left; the reduction crusher is at the right. The screening tower is in the background.

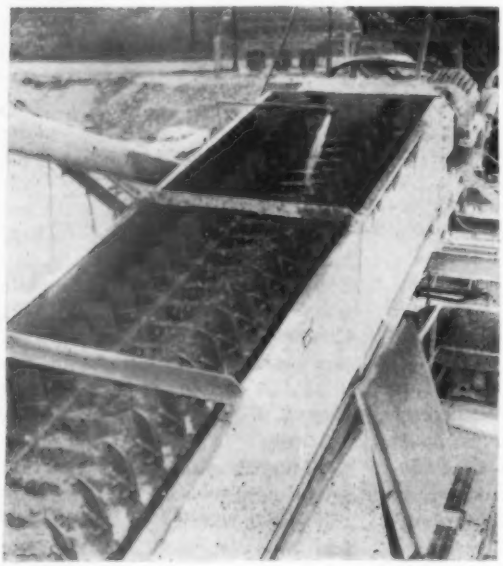
to an Allis-Chalmers Hydrocone crusher which reduces to minus ¾-in. The products of both crushers drop onto 24-in. by 160-ft. belt conveyor No. 3. Thence the material goes *via* a split chute to 24-in. by 116-ft. conveyor No. 4 back to the truck hopper. It can also go if desired onto a 3- by 16-ft. Allis-Chalmers Low Head 2-deck screen (No. 7). The undersize from this screen will be 46D—a gravel ranging from dust to ¾-in., which is used for roads, drives, etc., and this will go by gravity to a stockpile. The oversize from this screen will go to conveyor No. 4 back to the truck hopper.

The two undersizes from screen No. 6 are carried on 30-in. by 160-ft. conveyor No. 2 to the top of the main screening tower. There the flow is split to a pair of 5- by 12-ft. Ripl-Flo 2-deck screens (No. 1 and 2). Both have ¼-in. wirecloth on their top decks; but on the bottom one screen has ⅛-in. and the other $\frac{5}{32}$-in. in order to meet state specifications. The ⅛- to ⅞-in. gravel off both decks of these screens is chuted into a hopper, from which it is fed to a 36-in. by 25-ft. McLanahan & Stone log washer. The product is discharged direct to a 5- by 12-ft. Ripl-Flo 2-deck screen (No. 3) with ⅜- and $\frac{3}{32}$-in. openings. The $\frac{3}{32}$- to ⅜-in. material over the bottom deck is grit (No. 9), which is discharged by a 24-in. by 140-ft. stockpiling conveyor (No. 6) to a 4,200-ton ground stockpile.

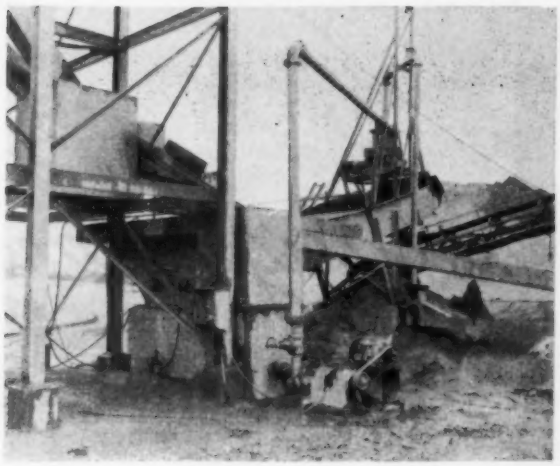
Material through the bottom deck of this screen (minus $\frac{3}{32}$-in.), largely clay and silt, goes to a waste flume.

The ⅜- to 1½-in. gravel over the top deck of screen No. 3 drops to screen No. 4, a 5- by 12-ft. Ripl-Flo 2-deck unit with ⅞- and ⅜-in. openings. The top size, ⅞- to 1½-in. (No. 3 gravel), goes to 24-in. by 140-ft. stockpiling conveyor No. 5, from which it is discharged to a 4,250-ton stockpile. The ⅝- to ⅞-in. gravel off the bottom deck of this screen—No. 3—is carried by 24-in. by 146-ft. conveyor No. 8 to a 4,500-ton stockpile. The ⅜- to ⅝-in. gravel through the bottom deck of this screen is No. 6, which is carried on 24-in. by 140-ft. conveyor No. 7 to a 4,250-ton stockpile.

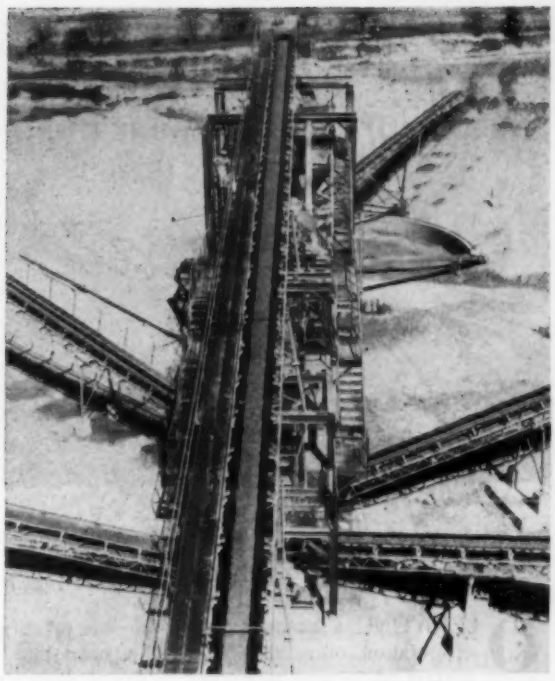
Sand through the ⅛-in. bottom decks of screens No. 1 and 2 is



The 36-in. by 25-ft. log washer which cleans minus ⅞-in. gravel before final sizing.



The 36-in. by 75-ft. double-screen sand classifier which feeds to the radial stacker. Overflow goes to the tank and pump (foreground) which feeds to the cyclone for reclamation of minus 50-mesh sand.



Right: A view of the screening tower from the scalping tower. The various gravel products go to stationary stockpiling conveyors. The radial sand stacker is in the background.

flumed to a 36-in. by 25-ft. McLanahan & Stone double-screw classifier. The overflow from this screw goes to a 4- by 4-ft. by 10-ft. high tank, from which a 4-in. Georgia Iron Works sand pump feeds it to a 25-in. diameter Georgia Whirlcone. This unit reclaims minus 50-mesh, sand, which, with the screw product, goes to a 24-in. by 80-ft. radial stockpiling conveyor (No. 9). This conveyor is on wheels on a 37-ft. radius rail, and can store up to 10,000 tons of concrete sand in a 180-deg. arc.

A Michigan 175A front-end loader is used for all recovery from stockpiles. Shipments are all weighed on a 25-ton Thurman truck scale.

Overflow from all sources is flumed through a 30-in. concrete pipe 100 ft. long to a waste pond.

Wash water is obtained from another pond through two 8-in. Weinman double-suction pumps operating in tandem, with the second pump building up the pressure. These supply 1,500 g.p.m. to sprays on both decks of the No. 1 and 2 screens, on the top deck of screen No. 3, to the log washers, and to the sand screw classifier.

The entire plant is controlled from a room in the scalping tower from which all operations can be seen. A central board having pushbuttons and lights is used. The plant is started up with the crushers, log washers, and screws first; then the screens are started from the top down, the scalping screens, and the belts, backward to No. 1. Stopping is done in reverse order. In case any machine stops, a green light goes on, and equipment ahead of it is stopped.

All belt conveyors were supplied by the E. F. Marsh Engineering Company. They have Manhattan belting. All except No. 1 and 2 are driven through Marsh Poly-V drives, which are flat belts with parallel ridges fitting into shallow V grooves in the pulleys. At this plant from 3 to 6 grooves are used. The No. 1 and 2 conveyors are driven through speed reducers. All screens have spring steel wirecloth, except the scalper, which has Allis-Chalmers perforated plate. All motors are Allis-Chalmers waterproof—100 hp. for the primary crusher and the water supply pump, and 75 hp. for the secondary crushers and the log washers.

The Arrow Sand and Gravel Company is a subsidiary of the Marble Cliff Quarries Company, a producer of crushed stone and lime.

Cement Production in China Increases by 50% During 1958

Production of cement in Red China during 1958 totalled more than 10,000,000 metric tons through December 20, according to the U. S. Bureau of Mines. This figure represents a 50 percent increase over 1957 production.

Annual productive capacity reportedly was 12,770,000 tons in mid-1958, an increase of 3,460,000 tons over 1957. Capacity expansion was to continue to a scheduled total output of 27,000,000 tons for 1959.

The Liuliko cement plant, Peiping, was increasing its annual capacity by 2,000,000 through installation of 10 additional kilns, 4 of which had begun operating in 1958. Five additional cement plants were scheduled to go into production during 1958 in Kwangtung.

The Wing On cement plant in Fukien, the largest cement plant being built in China during mid-1958, is expected to be completed in 1960, with a planned annual capacity of 1,002,000 tons. This is about 200,000 tons less than the annual capacity of the Tangshan cement plant.

New incentives for incorporating your business . . .

Corporate earnings can be taxed at INDIVIDUAL

By HAROLD J. ASHE

OPERATING a business as a corporation often results in certain advantages over other legal forms of doing business.

A partnership ceases on the death of any one of the partners, often creating insurmountable difficulties for the surviving partner or partners. In a partnership each partner is liable for all the business obligations, and one partner is sometimes exposed to greater hazards than others.

The life of a corporation, however, is not limited to the life-span of any stockholder or stockholders; and in this form of business organization each stockholder's liability is limited.

Pros and Cons

A good many partnership ventures, including those among relatives, might better be incorporated. With a corporate form of doing business, a principal owner (or owners) may encourage valued employees to become minority stockholders. This heightens their interest in the health of the business without jeopardizing the majority stockholders' management and direction (as might be the case if such employees were brought into a partnership).

Until recently, however, these advantages of incorporation were often outweighed by a fundamental disadvantage that could not be overcome. This was the inevitable double taxation of earnings, first at the corporate level and again at the shareholder level as the remaining earnings were distributed and taxed at the applicable individual income tax rates. Thus, if there were any corporation earnings whatsoever, the corporation form of doing business carried a tax penalty. For smaller businesses with few co-owners or a family ownership, the disadvantages of these forms seemed easier to bear than the tax burden stemming from incorporation.

New Tax Provision

In 1958 the Internal Revenue Code was amended to permit a corporation, under certain clearly defined conditions, to elect having corporate earnings taxed directly to its stockholders at individual income tax rates, bypassing the corporation tax. This amendment has created widespread and renewed interest among smaller business owners in doing business under the corporate setup. A good many non-corporate owners are already incorporating or are planning to do so.

However, before any owner or co-owner rushes to incorporate, he should understand the rules which must be observed to qualify a business for such income tax treatment. Business should analyze the circumstances to see whether incorporation really does offer advantages, and whether there are any concealed deadfalls. Probable future circumstances, as well as present conditions, may need to be considered.

Election of direct individual taxes. To qualify for an exemption from paying the corporate income tax, a corporation must comply with the following rules:

1. It must be a domestic corporation.
2. It must not be a member of an affiliated group requiring the filing of a consolidated return with another corporation.
3. It must not have more than ten stockholders.
4. All stockholders must be individuals or an estate.
5. No stockholders may be nonresident aliens.
6. There must be only one class of stock.

While the Code amendment is designed particularly to help small corporate businesses, there is, in fact, no limit placed on the amount of stock, assets, or profits. It may be no less beneficial to a larger, closely held business than to a smaller one.

Important Considerations

When the election must be made. To qualify for non-corporate income tax treatment, a corporation must make an election in the first month of its tax year or at any time within the month preceding the beginning of such tax year. (Owners considering incorporation should keep

now

RATES

this deadline in mind and should be able to meet it; if this is not done, they may have a corporate setup and still be required to pay a corporate tax.)

The election must be made on Form 2553, and it must be filed with the District Director, Internal Revenue Service, of the district in which the corporation's principal place of business is maintained.

Stockholders' consent. All shareholders, not merely a majority, must agree to the election in order to make it valid. This consent must be in the form of a signed statement to that effect. It must give the name and address of the corporation, the name of each shareholder and the number of shares owned, together with the date of acquisition. This consent agreement must be attached to Form 2553. Within 30 days after acquisition of stock by new stockholders, their consent must be filed.

Effective period. Once elected, the corporation tax exemption remains in effect for subsequent years unless revoked or terminated.

Revocation or termination. The election is revoked or terminated in the year of occurrence and subsequent years if:

1. A new shareholder fails to consent to the election.
2. After the first year to which the election applies, all stockholders agree to have the election revoked.
3. The corporation ceases to meet the conditions required.
4. More than 80 percent of corporate gross receipts for a tax year are from sources outside the United States.
5. More than 20 percent of the corporation's gross receipts for a tax year are from rents, dividends, royalties, interest, annuities, and sales or exchanges of stock or securities, to the extent of gains from such sales or exchanges.

Obviously, an eleventh shareholder would invalidate the privilege. So, too, would an increase in rental income if, in any year, such income should exceed 20 percent of gross receipts. If, in any year, corporation gross receipts were down, even a moderate amount of rental income could jeopardize the tax status, because of the percentage formula.

Renewing election. Having revoked its election not to be taxed as a corporation, a corporation may not again so elect for five years after the tax year for which the election was terminated.

All corporate earnings taxed. Shareholders must report their share of corporate earnings, regardless of whether all earnings have been distributed or some have been retained in the business. Their individual income tax returns must reflect their share of undistributed earnings, which would not be the case if a corporate tax had been paid. In any consideration of incorporating a business, this fact should not be overlooked. Those businesses already incorporated, and now making a practice of retaining some earnings, should also take this fact into account before making any election not to be taxed as a corporation.

How It Works

Suppose the ABC Company, Inc., has corporate earnings of $20,000 after each of its two stockholders draw $9,000 salary. By the old rules, the corporate tax would be $6,000 (30 percent on the first $25,000 of earnings; 52 percent on earnings above that figure). The remaining $14,000 is distributed equally between the two stockholders. As a result each shareholder has adjusted gross income of $16,000 ($9,000 in salary and $7,000 in dividends). Assuming each principal takes the standard deduction, has four exemptions, files a joint return, takes dividend credits and exclusion in computing his individual income tax, the tax will be $2,787. Each principal's individual income tax and share of the corporation tax will be $5,787.

Now consider what happens when the corporate shareholders elect to be taxed at individual rates. Each principal has $19,000 adjusted gross income, consisting of $10,000 in

(Continued on page 136)

CATERPILLAR'S No. 1 PROJECT

*PAYS OFF FOR YOU AGAIN**

New Cat Power Shift Transmission for D9 and D8 Tractors

CONTROL is mounted to the left of the operator. One selector lever eliminates gearshift, forward-reverse and flywheel clutch levers. The safety lever prevents accidental transmission engagement. The selector lever moves in a "U" path to various positions. To the left are three reverse speeds. To the right, three forward speeds. To change speed, simply move lever to the required position. To change travel direction, move lever to the opposite side. Changing speed and direction are as easy as that—without clutching—changes can be made while the machine is in motion under full load without loss of power or momentum.

HIGHER PRODUCTION PUSHLOADING: Power is quickly, easily adjusted to meet the demand. Shifting to higher gear boosts scraper out of cut quickly at higher speed. Speedy reverse quickly positions machine for next push.

HIGHER PRODUCTION BULLDOZING: As material builds up, Cat power shift transmission permits split-second shifting. There's a minimum of forward surge when the load is dropped. Instant reversing further slashes cycle time.

- **Shifts on-the-go under full load in a split-second!**
- **Changes speed, reverses direction with finger-tip control lever—and no clutching!**

The wraps are off—it's ready. After many years of research and on-the-job testing, Caterpillar now offers a revolutionary new drive for Cat D9 and D8 Tractors—power shift transmission. This new transmission—with an exclusive design—provides production highs never before possible with a track-type tractor. Here's why:

1. It combines for the *first* time the flexibility and anti-stall features of torque converter with the operating snap of direct drive. Because of its direct drive characteristics, it is more efficient than other power shifts.

2. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a fraction of a second.

Talk about productivity—the Cat power shift transmission delivers in a big way. Split-second on-the-go shifts give plenty of power in the highest gear possible. Shifting is so easy the operator just naturally gets more work out of the tractor. What's more, he gets it on the toughest, most demanding track-type jobs.

Besides the power shift transmission, you also have your choice of direct drive or torque converter in the D9 or D8. For complete facts on the new Cat power shift transmission see your Caterpillar Dealer. He's ready to explain in detail how it works, or to demonstrate its ruggedness . . . its ease of operation . . . its productivity. Name the date—he'll demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

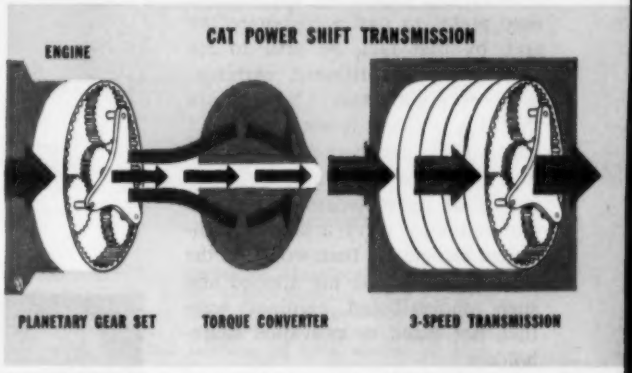
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

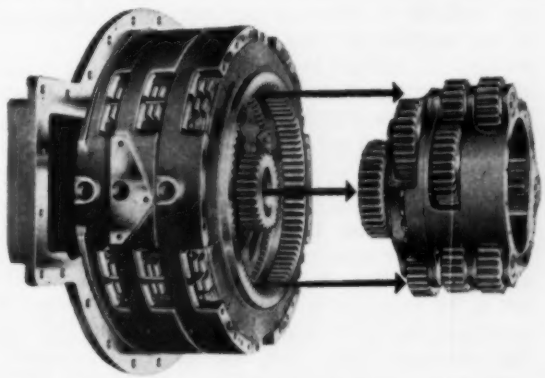
DIESEL ENGINES • TRACTORS • MOTOR GRADERS

EARTHMOVING EQUIPMENT

BORN OF RESEARCH
PROVED IN THE FIELD



BASIC DESIGN: Total power is transmitted from the engine to a planetary gear arrangement mounted in the engine flywheel. The planetary divides and directs the total power—part goes through a direct drive shaft straight to the transmission and the remainder through a torque converter to the transmission. This enables the Cat power shift transmission to combine the snap and positive operating feel of direct drive with the anti-stall and flexibility features of torque converter drive. Its clean, unit construction design makes it easy to service, when required.



ONE TON OF RUGGEDNESS: Here's a portion of the components that make up the new Cat power shift transmission. Designed and built specifically by Caterpillar for its giant tractors, this rugged transmission weighs well over a ton. Every component is constructed for long-lived service. Selected alloy steel insures a transmission that stands up under the toughest conditions. Equally important, Cat power shift transmission comes to you thoroughly tested by exacting design and demanding field work in the heaviest earthmoving duty.

***CATERPILLAR'S NO. 1 PROJECT:** A multimillion-dollar research program—to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

Enter 134 on card, page 155

Corporate Earnings

(*Continued from page* 133)

corporate earnings and $9,000 in salary. (Note that they lose the 4 percent credit on corporate dividends and $50 exclusion.) Each principal's individual income tax is $3,800, for a total tax saving over double taxation of $1,987.

Consider All Angles

Weigh consequences carefully. It may not always be advantageous to elect not to be taxed as a corporation. One or all shareholders, because of non-corporate income, may be subject to extremely high individual income tax rates.

A rapidly expanding corporation may prefer to pay a corporate tax and, by that fact, be able to retain some undistributed earnings, after corporate tax. (Note again that if a business is not taxed as a corporation, all earnings, whether distributed or not, are taxed to individual shareholders.) Retained earnings may carry a heavier individual income tax than would be the case if a corporate tax applied and such undistributed earnings were then not taxed to individual shareholders.

Fringe benefits. On the other hand, a corporate form of doing business permits corporate stockholder-officers, as corporate employees, to enjoy certain benefits not available to them as partners or sole proprietors. They may have medical and accident insurance, life insurance, pensions, and other benefits at corporate expense, provided rules are observed in respect to such benefits.

Figure carefully. Before taking any irrevocable steps to incorporate a business, with a view to electing not to be taxed as a corporation, principals should carefully consider the *pros* and *cons*. They should estimate the income tax both ways on anticipated net earnings in the first year, as well as on probable net earnings in future years. Without incorporating, an owner already reports earnings as an individual taxpayer and pays individual income tax rates thereon. He does not need to incorporate and make an election to get this tax benefit. On the other hand, the corporate form of doing business, now that double taxation is no longer a deterrent, may have many advantages. These *pros* and *cons* must be determined in the light of each individual case.

Get competent help. Before incorporating, owners should consult legal counsel fully acquainted with corporation law. They should seek the help of competent tax counsel to analyze the situation and point out the advantages, as well as future possible disadvantages, stemming from incorporation.

The qualifying conditions may need to be re-examined. An increase in revenue from certain sources may terminate the tax-exempt status of a corporation after it has been formed. A stockholder, uphappy with the business, may sell his stock to another stockholder. In that event, if the new stockholder refuses to consent to the election, the tax advantage ends.

However, these risks may be few or non-existent in the case of a business owned by only two or three partners, or by a principal and his wife. In that event, a closely-held or a family corporation may not only be a practicable but a logical form of doing business, double-tax being asserted against earnings.

Industry Personalities

L. W. Sprickman

Concluding a 35-year career in business, LOUIS W. SPRICKMAN, 67, has retired from service with Buffalo Crushed Stone Corporation, Bowmansville, N. Y., a unit of Houdaille Industries, Inc.

Mr. Sprickman joined the old Gravel Products Corporation as a salesman in 1946, and the next year was placed in charge of concrete pipe production at Tonawanda, N. Y., where he also directed pipe sales. Gravel Products was acquired by Houdaille in 1956 and merged into its Buffalo Crushed Stone unit. In 1957, Mr. Sprickman was assigned exclusively to pipe sales.

Paul C. Brickley has been promoted to the post of assistant sales manager of the Ash Grove Lime and Portland Cement Company, Omaha, Nebr. Mr. Brickley has been sales representative in northwest Iowa since 1946.

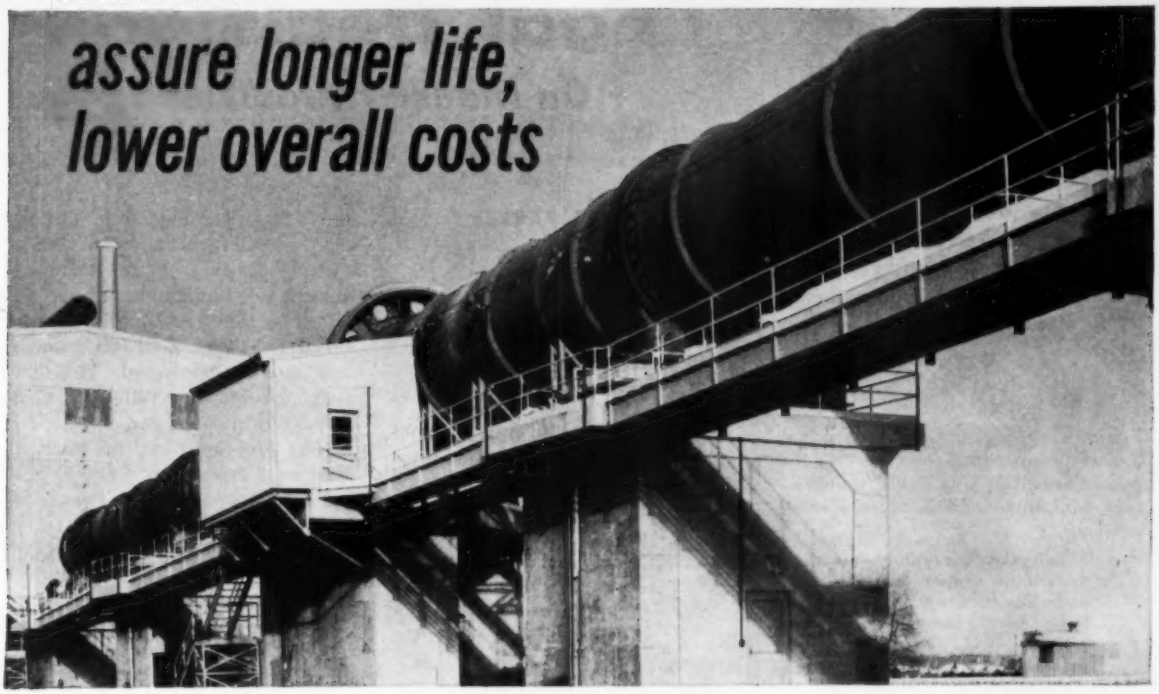
J. B. ARTHUR, founder of the Mexico Refractories Company, Mexico, Mo., now the Mexico Refractories Division of the Kaiser Aluminum and Chemical Corporation, is the new president of The Refractories Institute, national trade association in the field.

Mr. Arthur has been active in the affairs of the Institute since it was founded in 1951. With headquarters in Pittsburgh, Pa., the Institute promotes the interests of manufacturers and consumers of refractory products.

E. W. Kaiser

ELBERT W. KAISER, chief chemist at the Peerless Cement Company plant at Port Huron, Mich., has been named assistant plant superintendent in addition to his present duties as chief chemist. He joined the Peerless staff at Detroit in 1950. In 1956, he was transferred to the firm's Port Huron plant as chief chemist.

HARBISON-WALKER BALANCED LININGS



In the operation of rotary lime and dolomite kilns, there are many variables that affect the life of the refractory linings. Various destructive factors to which the refractories in different zones are subjected include impact and abrasion of the charge, corrosion by fuel ash and the charge at the high temperature of firing and spalling caused by thermal shock. Best results are assured when the properties of the refractories in each zone are balanced in relation to service life and cost.

Harbison-Walker refractories include all classes of brick, castables, plastic fire brick, mortars and insulating products.

Harbison-Walker freely offers technical service and recommendations that can result in the best balance for your particular conditions.

FOR HIGH TEMPERATURE ZONES

ALUSITE: This leading brand of 70% alumina refractory owes its extremely wide use for rotary lime kiln linings to its unusual combination of desirable properties. Its high density and low permeability account for its excellent resistance to penetration, such as promotes fluxing. ALUSITE is strong and highly resistant to mechanical stresses, abrasion and thermal shock.

FORSTERITE and THERMAG, Harbison-Walker basic brick fulfill the most severe burning zone requirements for extremely high temperature firing of refractory dolomite and for highly corrosive conditions such as accompany the burning of lime sludge of high alkali content.

FOR INTERMEDIATE ZONES

ALAMO (Super-Duty), and other Harbison-Walker super-duty and high duty brands of fireclay brick provide the best linings for the intermediate zones. The availability of these refractories from widely distributed plants in seven states, facilitates deliveries and assures lowest transportation costs.

FOR COLD ZONES

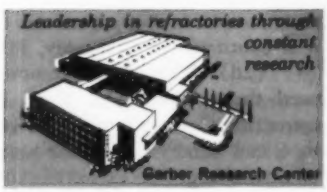
DURO, WYLAM A. These brands are the outstanding wear-resistant rotary kiln liners for cold zones of limestone burning kilns and for chain sections of lime sludge kilns.

MONOLITHIC REFRACTORIES

H-W EXTRA STRENGTH CASTABLE, among the various classes of monolithic refractories, is strongest and most resistant to impact and abrasion. It is easily applied around all designs of chain holders and renders excellent service in positions which are subjected to extreme wear.

VERTICAL SHAFT KILNS

The refractories here briefly explained for their use in rotary kilns supplemented by H-W SILICON CARBIDE and KORUNDAL (90% alumina), serve with superior results and best economy for every particular need of center fired and mixed feed shaft lime kilns.



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To improve performance and lower operating cost, insist on P&H Diesel power for all of your NEW construction equipment and REPOWERING needs.

- The rugged, heavy-duty P&H Diesel with extra torque never falters—supplies reserve power to pull through when the going gets rough.
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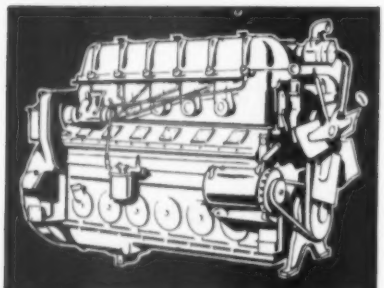
- Morning starts and cold weather are no problems—P&H Diesels kick right over.
- P&H fuel system is tailor-made for construction equipment—P&H Diesels idle for hours without fouling.
- 2-cycle P&H design minimizes power losses in altitude operation.

Compact, simplified P&H Diesel design results in easier maintenance—25% fewer parts, with all fittings easy to get at. All wearing parts are interchangeable. P&H Diesels in 2, 3, 4 and 6-cylinder models range from 40 to 320 h.p. See your P&H distributor, or write Dept. 412A, P&H Diesel Engine Division, Harnischfeger Corporation, Crystal Lake, Illinois.

P&H DIESEL



HARNISCHFEGER
P&H • Diesel Engine Division
Crystal Lake, Illinois

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Legal Decisions

On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Higher Court Reverses Jury's Award

GENERALLY speaking, a higher court will approve a verdict rendered by a jury as to the value of land appropriated by a state, county, or city for public purposes. However, the higher court will reverse the jury's verdict if the testimony clearly indicates that it failed to give due and proper consideration to the actual value of the appropriated land.

For example, in *City of Springfield v. Beals Industries Corporation,* 155 N. E. (2d) 501, the following important facts were disclosed by testimony: The Beals Industries Corporation owned 69½ acres of land from which it was taking sand and gravel. A city appropriated 26.08 acres of the land for the purpose of constructing a waterworks plant. The jury awarded the Beals Industries Corporation $45,000 as the value of the land. The Beals Industries Corporation appealed to the higher court on the contention that 26.08 acres of its land was well worth $252,000 because of the unusually high quality and vast extent of its underlying gravel deposit, which fact was not adequately considered by the jury. The higher court reversed the jury's verdict, saying:

"The jury's verdict was not sustained by evidence in apparently overlooking the important features of the gravel deposit."

Further testimony showed that the city lies in the central part of Beals Industries Corporation's property and involves some of its richest and deepest gravel deposit. It separates the remaining area into segments. Safety requires that in removing gravel from the residue, a substantial border or set-back be left undisturbed around the property taken and that a grade on a one-to-one ratio be maintained. This materially reduces the availability of the remaining gravel.

The jury awarded the Beals Industries Corporation $20,000 damages to the residue. The higher court reversed this award on the grounds that it was inadequate, saying:

"The quality and extent of the gravel deposit under appellant's (Beals Industries Corporation's) land is not disputed. Not only does gravel of excellent quality underlie appellant's entire property, but the deposit was also quite deep, extending in some places, including part of that taken, to a depth of at least 180 ft. It seems hardly possible that the jury could have given adequate consideration to this element and still have arrived at the conclusions it did as to value and damages to the residue."

Promise to Pay Is Implied

Some time ago I received an interesting letter from an official of a quarry company. He said: "Relying upon a promise (made) by a contractor that a town would pay for rock furnished and used upon the town's street, we hauled and spread a large quantity of rock on the streets. Now the town's officials have refused to pay for the rock. What can we do to collect the money due us for the rock?"

The answer is: Follow a decision by a higher court last month and sue the contractor.

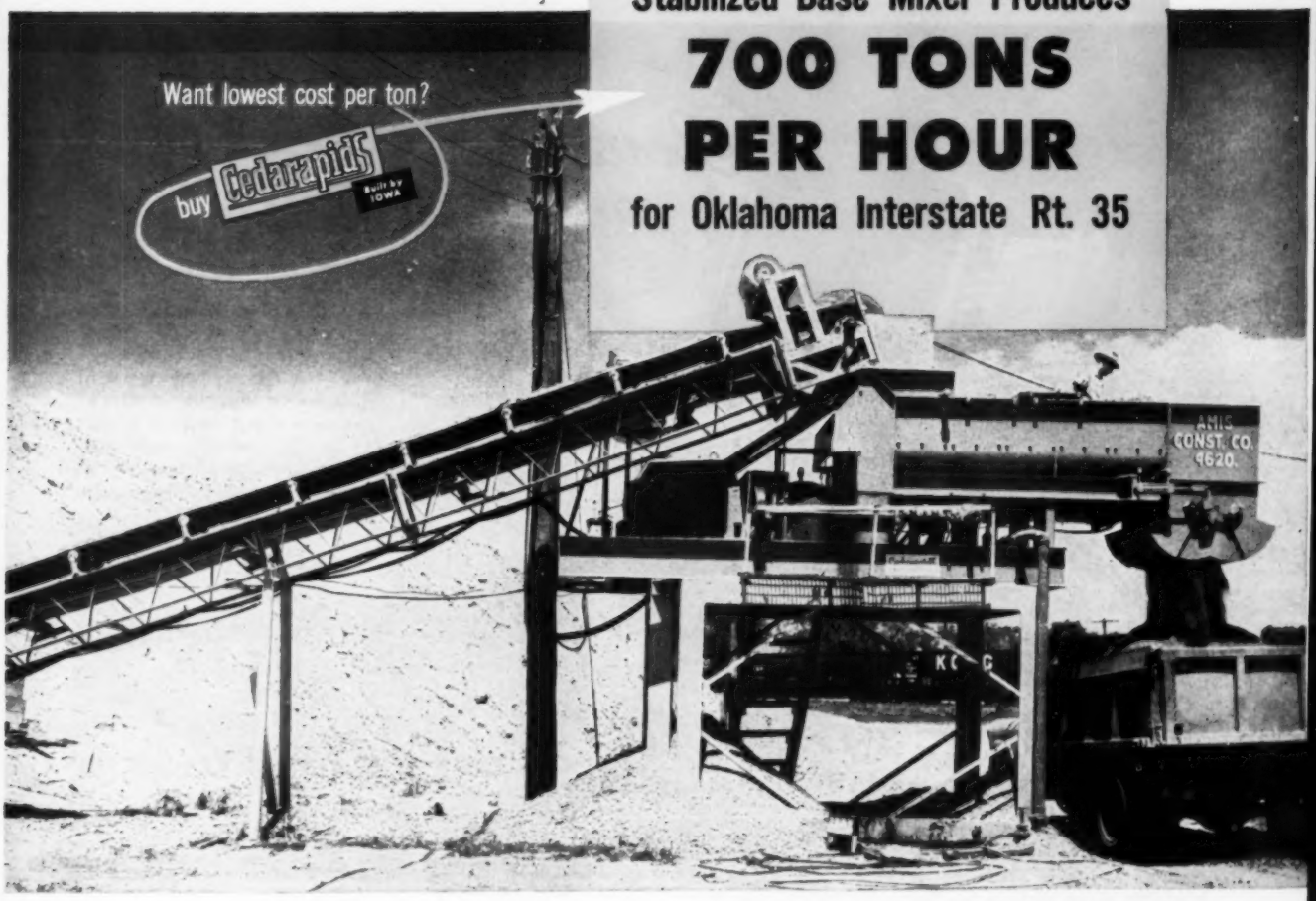
For example, in *Roop Quarries v. M & K Construction Company,* 319 S. W. (2d) 920, the testimony showed these facts: The M & K Construction Company began developing a new subdivision in the town of Warrensburg. It constructed

Enter 139 on card, page 155 →

Stabilized Base Mixer Produces

700 TONS PER HOUR

for Oklahoma Interstate Rt. 35



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With this versatile unit, you can mix a controlled amount of water with the aggregate, or add calcium chloride, Portland Cement or emulsified asphalt, as specified. Cedarapids feeders provide precise metering of these materials into the mixer.

That's a production record for plant-mixed stabilization material in Oklahoma! Specifications called for a particularly high quality of mix, too. But Amis Construction Company's Cedarapids Twin-Shaft Stabilized Base Mixer blended three sizes of aggregate, mixed it thoroughly with a precisely controlled amount of water, and produced over 700 tons of stabilized aggregate base per hour! In other States, Cedarapids Stabilized Base Mixers are producing as high as 860 tph as a measured minimum!

Production like this is one of the many Cedarapids benefits that assure lowest cost per ton. In the Stabilized Base Mixer, and *every* plant or component in the complete Cedarapids Line, engineering emphasis is placed on high production, the ability to meet strict specifications, and low-cost operation. It adds up to more profit on each ton you produce!

Bulletin SBM-1 gives complete engineering details of the two sizes of Cedarapids Stabilized Base Mixers. Send for your copy today.

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Cedar Rapids, Iowa, U. S. A.

Any time quick dumping action is needed, operator releases fast by-pass of fluid in hydraulic cylinders . . . *gravity* takes over . . . dumps load *instantly*. Hydraulic cylinders check body-tilt at 65° angle . . . have same cushioning action when dump body is returned to normal hauling position.

During a *full-controlled* dump cycle, hydraulic system acts as a retarder. *Gravity* actually tilts the body . . . hydraulic pressure *controls* the rate of discharge, or *holds* the dump body in any desired position . . . *No body-hoist!*

You get both in new 10-YARD Dumptor!

Plus→ **PIVOTING SEAT for 2-direction travel**

Operator always faces direction of travel . . . swings around *without leaving seat*. Dual steering wheels, throttle, brake pedals are located at both operating positions of pivoting seat. Directional travel and speed-range lever, and the dump controls are centrally-located for convenient 2-way operation . . . no-turn shuttle hauling.

Big things have happened since you last looked at Dumptors. A new, 10-yard Model 100, with 30,000-pound payload capacity, has been added to the Koehring® line. In addition to its dual dumping advantage, and new two-way controls for no-turn shuttle hauling, you also get: speeds up to 20 m.p.h. in either direction • speed-range selections controlled by easy-acting hydraulic clutches • constant-mesh transmission with smooth torque-converter drive • power steering • 28½% gradability, and many more advantages for low-cost, heavy-duty hauling. A smaller, companion-model 6-yard Dumptor® is also available. Why wait? Call Koehring distributor *today!*

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Milwaukee 16, Wisconsin

KOEHRING HEAVY DUTY

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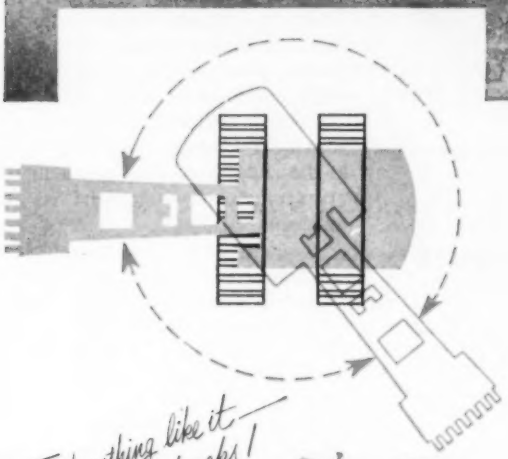

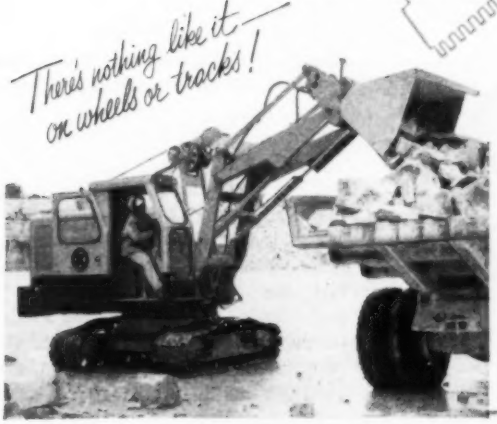

DIGS.. SWINGS.. and LOADS from "STAND-STILL" position

Full-revolving . . . free-swinging . . . Koehring SKOOPER gives you big-bucket digging and loading *without* the usual drive-in back-out waste motion of tractor front-end loaders . . . *without* the high track or tire maintenance of skid-turn operation. Follow SKOOPER through a typical dig-swing-dump-return cycle . . . check its *economy of motion*:

Powerful action of twin hydraulic rams crowds the 2-yard bucket along a smooth 7-foot level clean-up from *"stand-still"* position . . . or cuts at any angle of bank slope. Next, SKOOPER swings . . . dumps load fast, clean from roll-over bucket . . . then swings back, starts next cycle . . . *all without traveling.* Or . . . at any time, SKOOPER can swing and travel simultaneously . . . work with crawlers parallel to cut, or headed into bank. You also get 3 types of interchangeable buckets (rock, re-handling, general-purpose) . . . ample dumping height . . . *plus* excavator-crane convertibility. Call your Koehring distributor *today.*

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houses and caused the streets therein to be dedicated. An official of the construction company told a man named Marr, who owned the Roop Quarries, that purchasers of houses in the new subdivision could not move in until the streets were graveled as "the place was a loblolly." The official told Marr that the city had agreed to gravel and blacktop the streets, but that he was trying to hurry them up so that his houses could be occupied.

At the suggestion of the construction company's official, Marr had crushed rock hauled from the Roop Quarries and spread on the streets in this subdivision.

Later the city refused to pay for the rock, and Marr sued the M & K Construction Company for payment.

The jury held the construction company liable for payment although its official testified that the city ordered the rock. The higher court approved the verdict, saying:

"There was no suggestion that plaintiff (Roop Quarries) furnished such material gratuitously or without expectation of compensation. If defendant (M & K Construction Company) was benefitted thereby, then the law implied a promise to pay and verdict should be for plaintiffs (Roop Quarries)."

Unlicensed Contractor Recovers No Payment for Work

Recently a higher court rendered an unusually interesting and informative decision to the effect that a contractor who is not licensed in a state cannot file suit or recover payment for work done. On the other hand, the court held that this unlicensed contractor can sue and recover damages for all unlawful acts performed by his employer, or the general contractor.

For illustration, in *Leonard v. Hermreck,* 335 Pac. (2d) 515, the testimony showed these facts: A state law makes it unlawful for any person to act in the capacity of a contractor without a license. Also, the law provides that a contractor who has no license cannot file a suit in the state to recover payment for construction work done or for materials furnished.

A contractor named Hermreck was awarded a contract to construct a section of a state highway. Subsequently he entered into a subcontract with one Leonard, who agreed to haul approximately 220,000 tons of dirt from the P— C— pit to the roadbed of the highway between certain designated stations. The contract rate to be paid the plaintiff was 11 cents per ton. Leonard furnished a loader and trucks (with drivers) which took dirt from the "pit" and hauled it to designated places on the highway roadbed, where it was dumped. For certain reasons, Leonard ceased work before the contract was completely performed. Leonard left his loader on the project, which Hermreck appropriated without permission and used for loading purposes.

Leonard sued Hermreck to recover 11 cents per ton for the dirt he hauled and dumped on the highway. Due to the fact that Leonard held no contractor's license in the state, the higher court held that Hermreck could refuse to pay Leonard any money for the hauling he had done. This was so although Leonard contended that he did not

More Footage per Grind

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CARBIDE INSERTS

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ROK-MASTER
6-in dia for use with "Quarry-Master" drill.

Big hole—hard ground—blasting jobs go faster when your machines are equipped with Brunner & Lay 6-6½ or 7-in. bits. Special lapping process gives unusual resistance to wear and shock. You have less downtime, more profitime. Less bit grinding and steel handling, more output at reduced costs. For a demonstration, or more information, call your dealer or our nearest plant. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. 76 progressive years. Plants & conversion shops: Albuquerque, Asheville, Birmingham, Denver, Dorchester (Boston), Long Island City, Los Angeles, Philadelphia, Portland, Sacramento, Seattle, Yardley (Spokane), Lachine, P. Q., Vancouver, B. C.

Brunner & Lay carbide Master bits are available in sizes given. Our Rok-Bits in 1,000; 700; 600; 400; 200; J5.23; J5.5; J7.50 and standard wagon and hand held drill threads—in wide size range—and in these body types—cross, chisel, "X", cutaway and taper socket.

Write for this NEW bulletin DA I-58 on your letterhead, stating your position.

BRUNNER & LAY
HOLE-MASTER
6-6½-7-in for use with "down-the-hold" drill.

Brunner & Lay Products

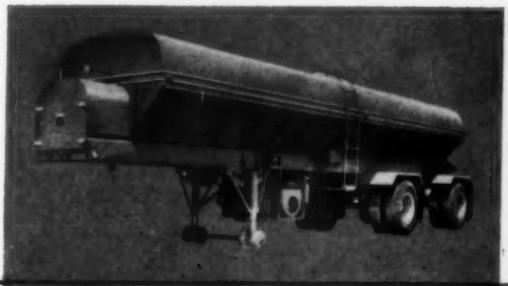
CARBIDE ROK-BITS • INTRASET STEEL • DRILL RODS • COUPLINGS, ADAPTERS & SECTIONAL STEEL

Enter 142 on card, page 155

From Aggregates...to cement...to Zinc sulfate
Dorsey Bulkmaster Transports deliver more payload...faster

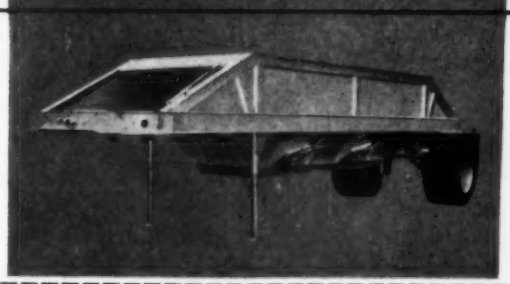
WHATEVER YOUR dry bulk cargo may be, these new Dorsey Bulkmasters are designed to *cut delivery time and costs.* So efficient they make light work of stubborn cargoes, and ruggedly engineered with quality features that insure long, trouble-free operation. Check the specifications of each model . . . decide which best suits *your needs* . . . and see your Dorsey Distributor today!

MODEL BMC-T For high speed and efficiency, the BMC-T features new two-stage drives that permit discharge of the rear portion of the load before the front screws are engaged. Screws are reversible to dislodge lumps and to assist air pads in eliminating bridging. The unit operates from the tractor P.T.O. through a tandem hydraulic pump and discharges five barrels per minute. Three 20" fill hatches with water-tight covers and single point downspout with rubberized nylon discharge boot are standard. A wide range of capacities and lengths as well as other "custom" features are available without price penalty.



MODEL FB-T This versatile performer pit dumps or can be equipped with 14-foot folding or rigid full-swiveling 18"-wide endless-belt conveyor. Tandem hydraulic pump, powered by a 25-hp air-cooled gasoline engine, operates rubber belt conveyor, which is riveted to a 36" heavy-duty steel conveyor chain, and elevators. The FB-T discharges in excess of a ton a minute. All-steel, electrically-welded body is equipped with heavy-duty tarpaulin and bows. A wide choice of options is available.

BOTTOM DUMP TRAILERS Your Dorsey Distributor now offers a complete line of open and closed top hopper trailers and trains for transporting cement, aggregate or any dry bulk material. The model illustrated has high-clearance doors giving a very heavy discharge pattern and also features a sturdy projecting rear bumper for pushing. Steep slope sides prevent load packing and there is no bracing inside hopper.



For more information on the newest in self-unloading transports see your Dorsey Distributor today, or MAIL THE COUPON

DORSEY

DORSEY TRAILERS / ELBA, ALABAMA

A Subsidiary of the Dorsey Corporation

Dorsey Trailers / Elba, Alabama PO-1

RUSH literature on

____Model BMC-T ____Model FB-T ____Hopper Trailers

Name _____

Company _____

Address _____

City and State _____

come within the provisions of the license law because he did nothing except deposit dirt on the roadbed, and that the grading, tamping, and other work was performed by Hermreck. The court said:

"Clearly, by agreeing to comply with the engineering plans and drawings for the construction of the freeway, plaintiff (Leonard) became more than a mere conveyor of dirt."

In other words, the higher court held that Leonard was a contractor and not a mere hauler of dirt.

Notwithstanding the above state law, the higher court held that Leonard may recover damages from Hermreck for the latter's appropriation of the loader without Leonard's consent. In this respect the court said:

"The defendant (Hermreck) wrongfully took his loader and refused to deliver possession of it to him. These alleged wrongful acts of defendant (Hermreck) occurred after the relationship created by the contract had terminated. The fact that here had been a relationship founded upon an illegal contract did not, upon termination of the relationship, give the defendant (Hermreck) the right to appropriate property belonging to the other party (Leonard) to the contract."

Court Uses own Judgment

Although testimony of physicians may not agree with that of an employee as to the severity of an injury which he claims he sustained, the court may decide the issue from presented testimony in favor of the employee.

For illustration, in *Reed v. Clay Center Concrete and Sand Company*, 336 Pac. (2d) 406, the testimony showed the following facts: On January 30 an employee of the Clay Center Concrete and Sand Company named Reed was working over a lintel table where concrete slabs were made. His trouser leg caught in a V-belt on the machine. He was flipped into the air and thrown onto the concrete floor, and his right leg was injured. He was taken to the hospital for treatment. Reed was released to return to work as fully recovered, and he did return on July 5. He testified that he still suffered pain in the hip and leg, suffered sleeplessness, walked with a limp, had to stop work frequently to rest, and took pills for pain and sleeplessness. He testified that because of his injuries he was unable to perform the heavy lifting required in his former job and that he resigned to work as a clerk in a store.

Although it was contended that Reed's apparent injuries were to his leg and were not nearly so severe as he claimed, yet the lower court allowed Reed compensation based upon his contended injuries. The higher court approved the verdict, saying:

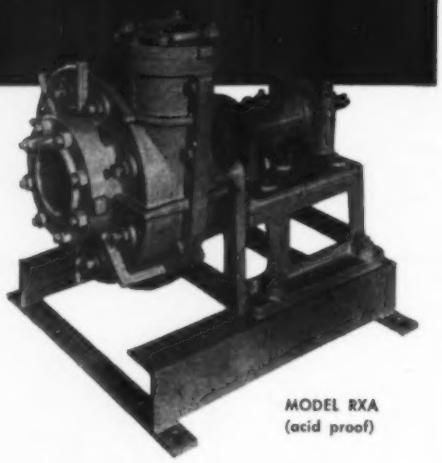
"We are of the opinion the evidence was sufficient to sustain the trial court's finding and judgment. It follows that the judgment of the trial court is affirmed."

Negligence Not Presumed

A few weeks ago a higher court clearly answered a question asked by an official of a corporation engaged in the production of nonmetallic materials. The question was stated as follows: "If a person is injured and sues a corporation, claiming

NEW!

PERFORMANCE-PROVED CERAMIC-LINED SAND PUMP



MODEL RXA (acid proof)

ARE YOU USING pumps for transferring fines? Is the volume in the range of 110′ head-150 GPM to 70′ head-600 GPM?

ARE YOU TIRED of replacing impellers, liners, shells, sleeves, seals, bearings, shafts, bolts, nuts, gaskets, etc., every few months?

ARE YOU WISHING someone would produce a pump worthy of your expectations? Something that would hold up for say — 14 months? 18 months? 2 years!

YOU WILL FIND the ultimate in wear resistance in ceramic lined pumps using silicon nitride bonded silicon carbide wear parts.

SOUND EXPENSIVE? Not at all. Cost is comparable to alloyed iron or rubber lined pumps.

For additional information on the new MODEL RXA Ceramic-Lined Sand Pump, write:

The KANSAS CITY HAY PRESS COMPANY
801 Woodswether Road Kansas City 6, Missouri

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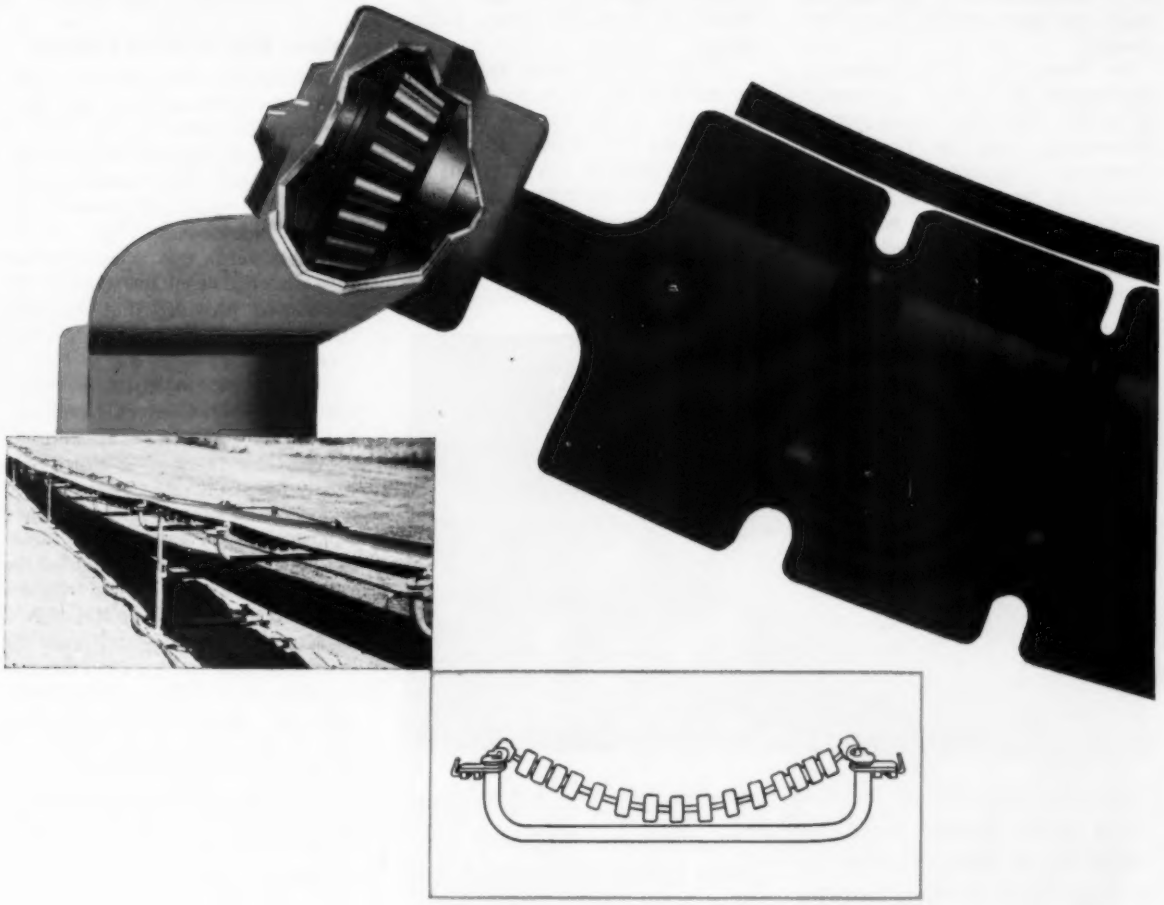
Bearing Location is the Key to Long Service Life



JOY LIMBEROLLER® CONVEYOR IDLERS

Joy Limberoller Conveyor Idlers give many times the normal service life, because the two bearings rest in slots in the support brackets—well away from spillage. On conveyor lines carrying sand, crushed rock, and other abrasive materials, Limberollers have given more than ten times the service life of steel idlers.

Limberoller Idlers consist of a neoprene coated wire rope to which are moulded neoprene discs. The ends of the rope turn in sealed bearings. This design not only eliminates clogging and freezing of the bearings, but also makes the idlers easy to service—they can be replaced while the belt is moving.

Limberollers are economical, not only because of long service life, but also because they can be spaced further apart than steel idlers. They are corrosion and flame resistant, self-cleaning, and eliminate the "bump" typical of steel idlers.

For complete details, write for Bulletin 342-26.

EQUIPMENT FOR CONSTRUCTION... FOR ALL INDUSTRY

JOY

Portable Compressors | Trac Drills | Tungsten Carbide Rock Bits | Hand-Held Rock Drills

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

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that its employee's negligence caused his injury, will the injured person be awarded damages although his injury may have resulted from other causes?"

For illustration, in *Blassingame v. Halliburton Cementing Company*, 317 S. W. (2d) 111, a man named Blassingame sued the Halliburton Cementing Company for injuries caused by an explosion. Blassingame contended, but did not prove, that he was entitled to recover damages because the explosion resulted from negligence of employees of the cement company. The higher court refused to hold the latter liable, saying:

"Where the evidence shows that the accident may have happened as the result of one of two or more causes, and it is not more reasonably probable that it was due to the negligence of the defendant (Halliburton Cementing Company), we are forced to the conclusion that no inference of negligence can be drawn from the testimony of the Blassingames or any other witness."

When Note Is Valid Payment

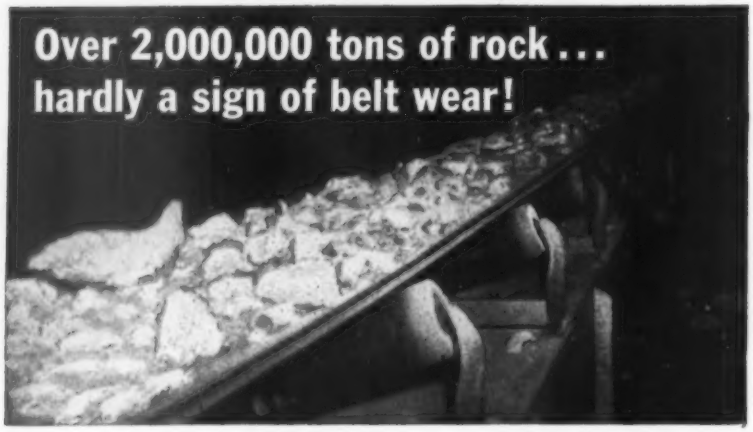
Considerable discussion has arisen from time to time over the legal question: If a debtor pays a creditor something supposed to be valuable, but not money, is the creditor obligated by his agreement to cancel the debtor's indebtedness?

A few weeks ago a higher court answered this legal question in the affirmative, provided that the testimony shows that the debtor practiced no fraud.

For example, in *Sustala v. North Side Ready-Mix Concrete Company*, 317 S. W. (2d) 64, the testimony proved these facts: The North Side Ready-Mix Concrete Company sued one Sustala to recover an alleged balance due for concrete and building materials. Sustala defended the suit by proving that he had assigned a note to the North Side Ready-Mix Concrete Company, and that the latter's official had signed a written contract in which it was stated that the company took the note "in full payment" of the account of $1,395.18 owed by Sustala.

When the company attempted to collect the money due on the note, its maker introduced receipts signed by Sustala which showed that the latter had collected the money originally due from the maker of the note, before it was assigned to the company.

The higher court held that the agreement signed by the company's official, stating that assignment of the note by Sustala fully cancelled the debt owed by Sustala, is valid if the testimony proved that the official of the company had advance knowledge that possibly the note would not be finally paid by its maker, or that Sustala had practiced no fraud. In other words, this court held that if Sustala was guilty of fraud by expressly or impliedly representing that the note would be paid in full to the company, Sustala's debt was not cancelled. Hence, by proper legal procedure the company could prove to the court that the face value of the assigned note was not collectible, whereby Sustala still would be liable to the North Side Ready-Mix Concrete Company for payment of $1,395.18 for con-



That's the story behind the New York Rubber Stonore Nyrex conveyor belt, in regular, daily use by a large stone company. In this crushed stone plant, this heavy-duty belt carries stone from the primary crusher, located under the floor of the pit, over a belt distance of 455 feet at a 19° angle.

A belt *has* to be good to stand the tension required here *and* hold up under the abrasive effects of the crushed stone at the same time! Yet, this is the kind of service that is expected—and achieved regularly—with conveyor belting manufactured by New York Rubber Corp.

Take Stonore, for example. Highest in quality, mildew-proof, and built for the most severe service, it successfully handles heavy ores, trap rock, crushed stone, coarse broken glass, slag, cement clinkers, and direct feed from digging and mining machinery. It is also available as a special mucker belt.

If you want the service that this belt provides — or need any other type conveyor belt — it will pay you to consult New York Rubber. Drop us a line — there's no obligation. Address: Department PQ-4.

NY RUBBER

NEW YORK RUBBER
CORPORATION
Established 1851
100 PARK AVENUE • NEW YORK 17, NEW YORK

Enter 146 on card, page 155

crete and materials purchased by him. This court said:

"There can be no question that the notes of third persons may by agreement be received in payment of an indebtedness. Thus, the unconditional acceptance of a note of a third person, with the agreement that it shall be in full satisfaction of the amount due by the creditor, operates as payment. If a creditor accepts from his debtor the note of a third party, with the understanding that it shall be in satisfaction of the latter debt, we see nothing to prevent this from being a legal contract, whether this be expressly stipulated or not."

This court explained further that two parties may enter into any reasonable contract they want to make, and the court will not render a decision designed to protect one of the contracting parties against financial loss resulting from his own poor judgment or foolishness. On the other hand, all courts will protect either of the contracting parties against fraud or misrepresentation of the other party.

New Law on Forged Checks

In the past all higher courts have consistently held that if a bank cashes a forged check, the bank must suffer the financial loss, not the depositor. A few days ago a higher court reversed this law. This higher court held that if a bank cashes a forged bank check it is not liable if it proves that the money was received by the person who would have received it if the signature had been authentic.

For example, in *Commercial Credit Corporation v. Empire Trust Company*, 260 Fed. Rep. (2d) 132, the testimony showed these facts: A man named Beach and his wife entered into negotiations with the Commercial Credit Corporation to borrow $12,000. Finally a loan agreement was entered into between Beach and his wife and the credit corporation, under which a note for $12,000 was executed purportedly by Howard A. Beach and his wife, Mary L. Beach. At this time a bank check for $12,000 was given to Beach and his wife by the credit corporation. Later the endorsements of Howard A. Beach and Mary L. Beach were written on the back of this check, which was then cashed by the latter at a bank.

Several months later Beach became insolvent and he could not repay the $12,000 loan. Then it was discovered that Beach's wife, Mary L. Beach, had not endorsed the check. Her signature had been forged by her husband.

The Commercial Credit Corporation sued the bank which had cashed this check to recover the $12,000.

The higher court refused to hold the bank liable, and said:

"Inasmuch as the proceeds of the check went to and were received by Howard A. Beach, the only person entitled thereto, it follows that plaintiff (Commercial Credit Corporation) suffered no loss by reason of the bank liable, and said:

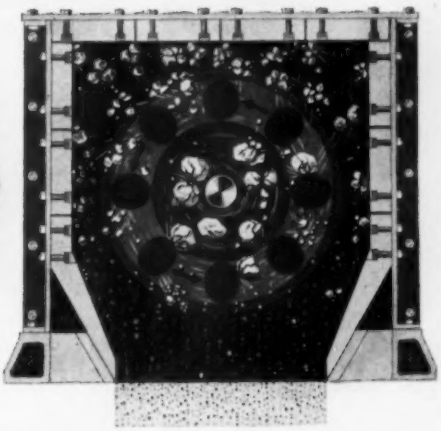
In other words, this court held that where a forged check causes no financial loss to a depositor or the payee, the bank which cashed the check is not liable to anyone.

Unfair Competition Law Is Valid

Some time ago I received an interesting letter from an official of a

SIZE AND UPGRADE YOUR AGGREGATES FOR BOTH CONCRETE AND BITUMINOUS MIX

STEDMAN CAGE MILL



The Stedman Single-Cage Mill reduces Gravel and Stone, either wet or dry, via the Internal-Impact Principle. See Fig. 523 above. It pulverizes unsound material to be passed off with fines—the discharged product going to wet screens, log washer, jigs, or heavy media process.

The Stedman Single-Cage Mill not only upgrades your product, but also gives the greatest percent of crushed surfaces for Black Top Mix. Example: "Crush your — 2" + ¼" including pea gravel to a product of ¾" x 0, screen out minus ¼" sand and furnish a specification product for Bituminous Mix with 65 to 100% crushed particles."

Variation of speeds and type of cage result in a wide variety of product sizes.

Wire or write for information.

125th Anniversary STEDMAN 1834 1959

STEDMAN FOUNDRY and MACHINE COMPANY, INC.

Subsidiary of United Engineering and Foundry Company
AURORA, INDIANA, U. S. A.

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STEP UP YOUR ROCK DRILLING WITH GARDNER-DENVER QUALITY

Only Gardner-Denver offers five crawler drill models. Swing boom or standard "Air Trac"® drills. Extra-long tracks available for greater traction and stability. Efficiently grouped controls. Choose powerful 4", 4½" or 5½" bore drills.

Gardner-Denver all-weather rotary portables assure dependable and efficient compressed air power. Six capacities from 85 to 900 cfm. Wheel- or skid-mounted. Readily maintained on location.

Handle clean-up and secondary blasting with speed and ease. Use Gardner-Denver sinkers. A size and weight for every need. Powerful . . . easy handling . . . good hole cleaning ability.

Gardner-Denver's "Mole-Dril"* is a rugged, heavy-duty percussion drill, designed to cut deep bore holes with unusual speed. It delivers more foot-pounds of energy to the bit than any other drill. Maximum drilling obtained in the hardest or softest rock.

Ask the Gardner-Denver engineer about percussion drills for your rotary rig. His experience can help you select the best size and type for your pit. Remember, the Gardner-Denver "Mole-Dril" is MORE POWERFUL... MORE PRODUCTIVE . . . MORE EFFICIENT!

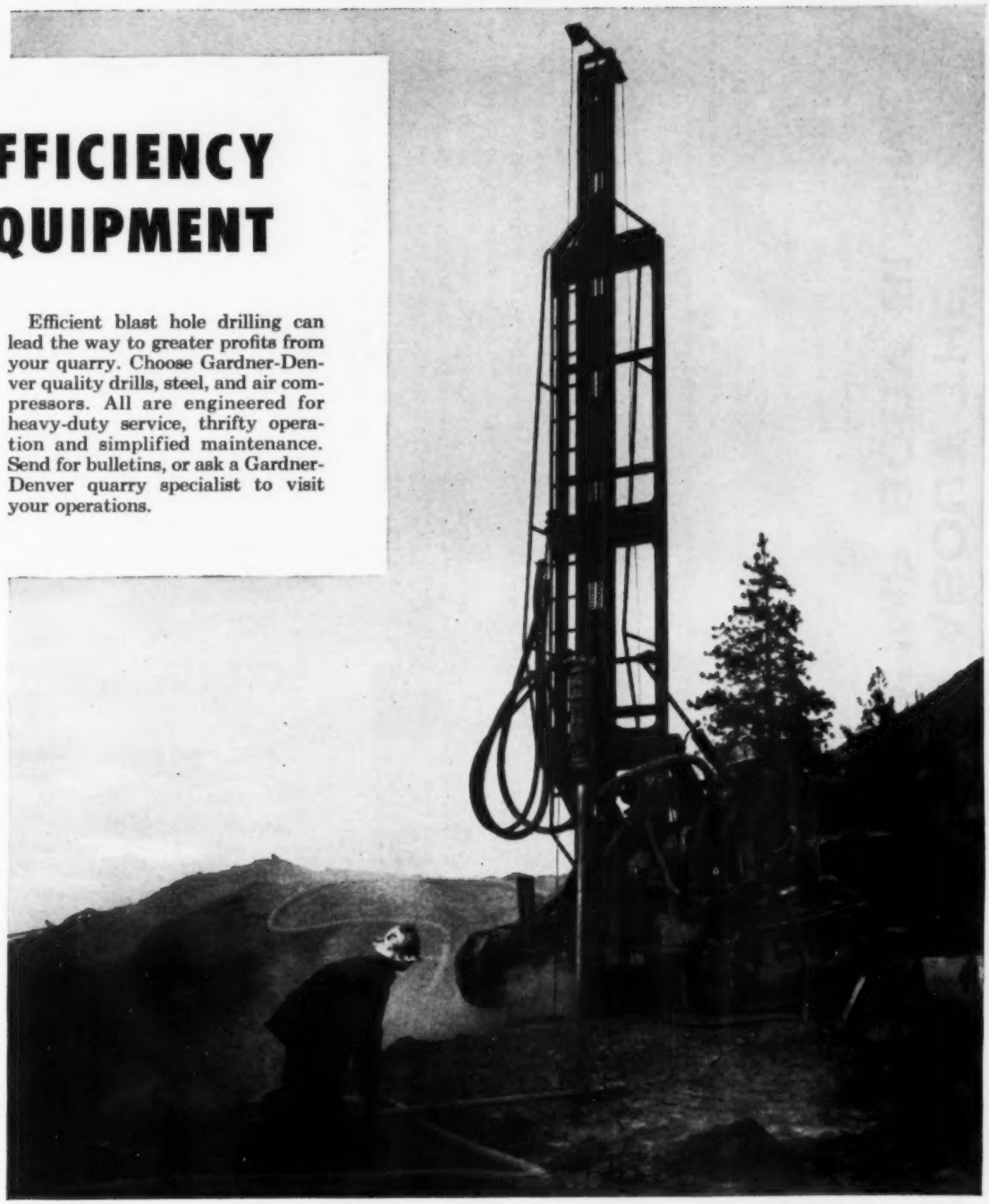
*Trade-Mark

TIME TO TALK TIME-SAVING

Your Gardner-Denver quarry specialist is a good man to know. Ask him how Gardner-Denver equipment can help save time, cut costs, increase production. At Gardner-Denver there's no substitute for men—our 100-year philosophy of growth.

EFFICIENCY EQUIPMENT

Efficient blast hole drilling can lead the way to greater profits from your quarry. Choose Gardner-Denver quality drills, steel, and air compressors. All are engineered for heavy-duty service, thrifty operation and simplified maintenance. Send for bulletins, or ask a Gardner-Denver quarry specialist to visit your operations.



The best drill steel you can buy. Gardner-Denver carburized and shot-peened sectional rod and couplings. Hardened surface resists abrasion. Tough core provides compressive strength. Lasts longer. Cuts your steel cost per ton of rock.

Heavy-duty, self-propelled crawler drill. Gardner-Denver HT143 carries powerful drill with 5½" hammer diameter. Handles 20' sectional steel changes. Finger-tip controls. A high-performance drill for either bench or toe hole drilling.

GARDNER-DENVER Since 1859 100 1959 YEARS

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

NEWS ABOUT THE DUMP BODY BUSINESS

Increase Your Earning Power with MARION'S New Front End Hoist For 8, 9, 10 Foot Bodies

The top plate is connected to the top of the cylinder before the body is installed. Then on the body is let down, the cylinder will guide itself into place in the cylinder housing. The body is then secured from the outside at the top by two bolts that fasten the body to the top plate.

Another rugged and competitively priced Marion hoist is now available in three models for 8, 9 and 10-foot bodies. Outstanding features incorporated in the hoist provide time and performance saving benefits for all users.

● The method of attaching the cylinder to the body speeds up installation and allows fast, easy detachment for any servicing in the field (see diagram).● The deep oil reservoir, mounted on the side, provides a quieter, cooler, more efficient hydraulic system and eliminates the danger of drawing air into the system ● Weight savings from 65 to 270 pounds ● Fast dumping speed ● Pump with safety relief valve.

Write for a bulletin covering the three models, F-5137-65-72-82.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.

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large corporation which specializes in selling ready mixed concrete. He wanted to know whether or not his corporation can lawfully sell ready mixed concrete at lower prices in certain areas than it sells this material in other localities, notwithstanding a state law which prohibits this practice.

For instance, in *Concrete Corporation v. Arkhola Sand and Gravel Company*, 322 S. W. (2d) 452, the testimony showed these facts: A law in the state of Arkansas makes it unlawful for one engaged in the sale and distribution of merchandise to discriminate between different sections, communities, or cities with the intent to destroy competition by selling at a lower rate in one such section than in another, after making allowance for difference in grade, quality or quantity, and the actual cost of transportation. The injured firm is given the right under this law to treble the damages and an injunction.

The Concrete Corporation is engaged in the ready mixed concrete business, with offices at Rogers, Ark. The Arkhola Sand & Gravel Company is also engaged in the ready mixed concrete business, and it has offices at several locations in the state.

The Concrete Corporation sued the Arkhola Sand and Gravel Company for an injunction and treble damages, on the contention that the latter company had violated the above-mentioned state law by selling its ready mixed concrete in the Rogers territory at lower rates than those charged in other towns and cities served by it. The counsel for the Concrete Corporation contended that the sale of said ready mixed concrete at such lower rates is made by the Arkhola Sand and Gravel Company with the intent to destroy the competition of the Concrete Corporation.

The lower court rendered a decision holding that the Concrete Corporation could not recover treble damages from the Arkhola Sand and Gravel Company, and also it refused to issue an injunction prohibiting the Arkhola Sand and Gravel Company from selling ready mixed concrete in Rogers at lower prices than it sells this same material in other locations and areas in the state.

(*Continued on page* 160)

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Only BAGPAKS® have a built-in insurance policy backed by International Paper

ACCIDENTS like this *will* happen. That's why International Paper plans for extraordinary stresses and strains when designing its Bagpak multiwall bags.

Only genuine *Gator Hide*® kraft, famous for toughness, is ever used in making Bagpak multiwalls. Quality is controlled every step of the way. International Paper can do this because it grows its own trees, makes its own paper, converts it into printed multiwall bags to your order. It also designs and builds *Bagpaker*® machines that can package up to 60 tons of material per hour!

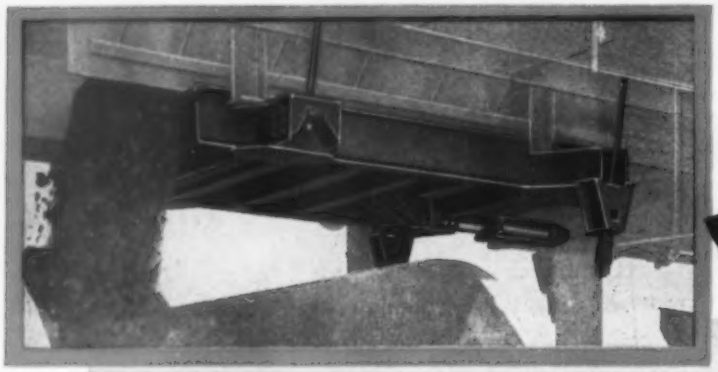
When you buy Bagpak multiwall bags you get speedy shipments geared to your production schedules. *Twenty-one* sales offices and four strategically-located plants save you money by keeping your inventory at a minimum.

Only Bagpak multiwalls are backed by the full resources of International Paper—world's foremost pulp, paper and paperboard producer.

Next time your Bagpak field service engineer drops by, ask him what's new. He knows.

Bagpak Division **INTERNATIONAL PAPER** New York 17, N.Y.

HEAVY DUTY HYDRASTROKE* FEEDER



for PLANTS and QUARRIES

PATENT APPLIED FOR

Exclusive HYDRAULIC OPERATION

A Reciprocating Feeder easily adapted to feed Screens, Crushers, Belts, Trucks, Skips or Railroad Cars.

- **FEEDER DESIGNED FOR SEVERE SHOCK LOADING**
- **ROCKER MOUNTING OR SUSPENSION**
  eliminates wear due to friction, needs no lubrication, takes minimum head room.
- **WIDE RANGE OF SIZES**
  widths from 36" to 96", feeding capacities from 200 to 7500 tons per hour.

Write for Illustrated Brochures

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50th Avenue West and Ramsey Street
Duluth 7, Minnesota

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Winslow TRUCK SCALES

PIT AND PITLESS TYPES

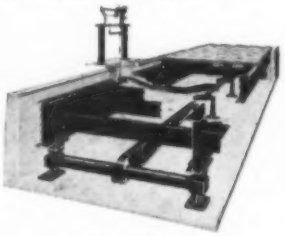
CABINET DIAL

Weight indication available includes ball bearing poise weighbeams, direct reading and weight imprinting types, and dial equipment with or without weight printer.

Write or phone for more information
PHONE NORTH 1231

TYPE CS—PORTABLE—PITLESS

Type CS scales, pitless installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 50 tons. Platform sizes 18' x 9' thru 40' x 10', wood or steel deck.



TYPE S—PIT SCALE

Type S scales, pit installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 60 tons. Platform Sizes 22' x 9' thru 60' x 10' for wood or concrete decks.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.

4810 NORTH 25TH ST. TERRE HAUTE, IND.

SCALE MANUFACTURERS FOR OVER A HALF-CENTURY

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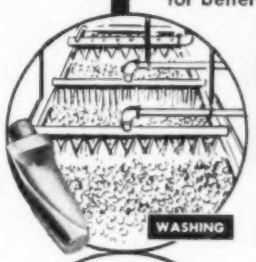
for better washing . . . dust control . . . concrete curing

SPRAY NOZZLES

from Spraying Systems Co.



- **complete choice of types and capacities to fit your job**
- **greater efficiency with minimum volume of water**

Proper distribution and impact for washing . . . or proper atomization for dust control and concrete curing without unnecessary wetting . . . these are just some of the advantages of having a complete choice of spray nozzle types and sizes to fit your job. For complete information write for Catalog 24.

SPRAYING SYSTEMS CO.

3224 RANDOLPH STREET
BELLWOOD, ILLINOIS

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NEW TALBERT'S "SKELETON – FRAME"

greater payload capacity for frame dump trailers

Talbert's "Skeleton-Frame" construction provides the stability of frame-type Dump Trailers . . . PLUS . . . the increase of thousands of pounds to your payload! Only Talbert combines the features of frame construction with "frameless" light weight.

CHECK AND SEE . . . you'll agree Talbert gives more!

STABILITY AND SAFETY—All axles are securely on the ground during lift.

PROVEN WEIGHT DISTRIBUTION—Usually not found in frameless trailer designs.

EASIER HANDLING—More reliable in tough unloading areas.

HIGHER STOCK PILING — Reduces rehandling costs and material storage areas.

Don't chance it! Get that extra margin of safety! . . . with increased payload! Talbert's "Skeleton-Frame" Dump Trailer is available in 20 and 26 foot lengths. Get Talbert Trailers for longer service with less maintenance. Your Talbert Distributor will gladly tell you all about it . . . see him today . . . or write for complete information!

Talbert Trailers, Inc.
7975 WEST 47th STREET
LYONS, ILLINOIS

all-new 365-cfm GYRO-FLO

...a heavy-duty portable compressor with MORE POWER and MORE PERFORMANCE

Ingersoll-Rand, the pioneer builder of portable rotary compressors, now offers a completely new size Gyro-Flo portable—the DR-365. This rugged, all-new compressor provides 365 cfm of mobile air power—16% more than its predecessor, the Gyro-Flo 315. Yet, the DR-365 is no bigger than the 315 cfm Gyro-Flo, and its larger, more powerful engine retains the same 1800 RPM speed.

Take a closer look at what this all-new compressor offers: A new, simplified, more-efficient compressor system with...automatic drainage of oil from cylinders when the unit is shut down...dependable Air-Glide capacity control for 100% stepless regulation...a 12-volt battery system for faster, easier starting... side covers that fold back safely out of the way... a full-length, large capacity tool box to provide extra storage space...all operating controls, fuel tank, filters and tool storage enclosed by lockable side covers. These are just a few of the many features that mean more power, better performance, and greater convenience and safety, too.

The Gyro-Flo 365 is powered by the GM 4-71, 4-cylinder diesel engine. The Gyro-Flo 365 has a heavy-duty, spring-mounted running gear with automotive-type steering—every part built to withstand the hard service encountered on construction jobs. And remember, Ingersoll-Rand's Gyro-Flo line is complete ...six sizes that have become first choice among performance- and economy-minded construction men.

Ask your Ingersoll-Rand representative for complete information or send today for Bulletin 2932.

DIMENSIONS AND WEIGHTS	DR-365 with Diesel Engine
4-WHEEL MOUNTING	
Weight (dry)	5939
Weight (wet)	6640
Length (less drawbar)	10' x 5¾"
Width	5' x 8"
Height	6' x 10½"
Track	56
LESS RUNNING GEAR	
Weight (dry)	5279
Weight (wet)	5980
Length	10' x 2⅞"
Width	4' x 9½"
Height	5' x 2¾"

Ingersoll-Rand
11 Broadway, New York 4, N. Y.
2-959

AN UNBEATABLE COMBINATION...GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

THE CONTRO MIL, a contra-rotating centrifugal impact mill, is the topic of a publication from the *Entoleter Division. Safety Industries, Inc.* Included are facts and figures on wear resistance; motor, rotor, and installation specifications; and information on applications. **(301)**

"PRODUCTS FOR THE CONSTRUCTION INDUSTRY" has been revised by the *Le Roi Division, Westinghouse Air Brake Company,* to include several new photographs and additional information on its line of rotary and piston-type portable air compressors, the improved Tractair, and air tools. **(302)**

HEAVY LIQUIDS for sink-float density determinations in quality control and research are described in a 12-page booklet offered by *Engineered Materials.* Both aqueous and organic liquids are described, and, for the higher ranges, suspensions of mercury in a heavy liquid. **(303)**

AMMCO PORTABLE DREDGES are detailed in literature available from the *American Marine and Machinery Company.* The bulletin explains such features as one-man push-button control, elevated control room, powerful hydraulic drives on cutter-head and winches; fewer moving parts; and reduced maintenance. **(304)**

TELSMITH GYRASPHERE SECONDARY CRUSHERS are described in Bulletin No. 274, released by the *Smith Engineering Works.* These Gyraspheres are designed especially for course and fine crushing, and are made in 24-, 36-, 48-, and the new 66-in. sizes. **(305)**

A SORBTEX MANUAL has been published by *Voss Engineering, Inc.,* to assist engineers in solving objectionable vibration and shock conditions with Sorbtex pre-formed fabric neoprene and rubber pad materials. The manual contains a complete set of reference charts and text, and presents many new concepts in the use of Sorbtex, a non-linear type of isolator. **(306)**

"THE MODERN SOLUTION TO FUME AND DUST FILTRATION PROBLEMS," a folder issued by *Menardi & Company,* describes features and applications of Maco-Glas fabric filter bags. These filter bags operate at temperatures over 500 deg. F., and are reported to end corrosion caused by condensation; eliminate shaking; and maintain constant permeability. **(307)**

MODEL 100 DUMPTOR, a 10-cu. yd. capacity off-the-road hauling unit, is the subject of a new bulletin available from the *Koehring Division, Koehring Company.* The bulletin features on-the-job views, component parts blow-ups, and drawings to illustrate and describe the machine's two-way controls, instantaneous gravity dump (and controlled gravity dump), and no-turn operation. **(308)**

A NEW HIGH TORQUE CONTROL DRIVE has been included in the revised version of Product Specification P81-1, issued by the *Bailey Meter Company.* All four sizes, producing torques from 50 to 2,250 ft. lb., and suitable for applications to 250 deg. F., are described. **(309)**

THE DEVELOPMENT OF MODERN HYDRAULIC DREDGES is traced in a report offered by the *Ellicott Machine Corporation.* The report sets forth the principles of hydraulic dredging and discusses design and performance of modern dredging units. A line drawing illustrates a dredge and fill operation typical of projects handled by this type of equipment. **(310)**

"ELECTRIC MOTORS AND GENERATORS . . . A.C. and D.C.," a product bulletin published by the *Imperial Electric Company,* covers squirrel-cage a.c. motors, special purpose motors, wound-rotor motors, d.c. motors, generators, and motor-generator sets. The range of motors covered is from 1 to 200 hp.; motor-generator sets covered range from ½ to 150 kw. **(311)**

OCTOBER **PIT AND QUARRY** **1959**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

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THERMOCOUPLE CATALOG EN-S2, newly-revised by the *Leeds & Northrup Company,* offers complete information about the firm's full line of thermocouples and thermocouple components and accessories. Recommendations are given on the choice and use of thermocouples and assemblies and on the limitations of protecting tube and well materials. **(312)**

SHAFT-MOUNTED SPEED REDUCERS are detailed in Booklet No. J-19, released by *Hewitt-Robins Incorporated.* Detailed engineering data includes 24 pages of rating tables, selection procedures, and other technical data. **(313)**

INFORMATION ON INDUSTRIAL WEIGHING SYSTEMS is presented in a series of four Fact Folders prepared by *The A. H. Emery Company.* The folders cover the basic art of weighing, accuracy in weighing systems, the Emery "rolling ball" head, and the instrumentation used with modern weighing systems. **(314)**

MODEL GTRY LOW BED SEMI-TRAILER with removable gooseneck and triple axle is covered in a specification brochure from *Transport Trailers, Inc.* Listing features and specifications, this brochure explains in detail the trailer's main components. Capacities range from 35 to 75 tons. **(315)**

MODEL 204 TROJAN TRACTOR SHOVEL is described in a specification bulletin issued by *The Yale & Towne Manufacturing Company.* Standard and optional equipment is listed for the new machine, which has three interchangeable buckets to provide a carrying capacity from 1½ to 2¾ cu. yd. **(316)**

A NEW ARMATURE DRIVE for heavy-duty application is described in a 4-page brochure offered by the *Warner Electric Brake & Clutch Company.* Sections cover operation, dimensions, replacement parts, and installations. **(317)**

THE USE OF GAMMA RADIATION DENSITY GAUGES on portland cement wet process raw mills to control percent solids in the output slurry is described in a bulletin available from *The Ohmart Corporation.* Installations are described and benefits are explained. **(318)**

MAXIBRAKE ATTACHMENT for air brake systems is the topic of a bulletin from *Maxibrake, Inc.* The Maxibrake, placed between the service brake and its mounting bracket, provides an automatic, mechanical application of the brake when the normal air supply for the service brake is depleted. **(319)**

OPERATING PRINCIPLES OF THE HYDRO-FILTER, a wet-type dust collector, are explained in a bulletin offered by the *National Dust Collector Corporation.* Presented are dimensions, specifications, and capacity data on four models ranging in capacity from 1,000 to 40,000 c.f.m. **(320)**

AN EXPANDED LINE OF PARA-FLEX COUPLINGS, ranging from fractional to 190 hp. per 100 r.p.m., is described in a 12-page bulletin from the *Dodge Manufacturing Corporation.* Detailed tables of horsepower ratings, dimensions, and service factors for many applications are given. **(321)**

ALLISPEDE ADJUSTABLE SPEED DRIVE, offering speed ranges up to 8:1 and available in ratings from 1 to 30 hp., is covered in a booklet from *The Louis Allis Company.* Engineering and application data and a cutaway view of a typical unit are included. Modifications to the basic drive are illustrated. **(322)**

AIR SUPPLY ACCESSORIES manufactured by the *Lincoln Engineering Company* are illustrated and described in Catalog No. 227. Included are sockets, plugs, hose clamps, fittings, and tools, all of which are interchangeable with most standard makes. **(323)**

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*U. S., U. S. Possessions, and Canada only.

Pan American countries, $10 a year; elsewhere, $15 a year.

Picture of rock going places in a hurry

MANITOWOCS SET THE PACE FOR HIGHER PRODUCTION

For steady, big output, you've got to go some to match the performance of a rugged Manitowoc rock shovel. However, increased tonnage and faster cycles aren't the whole story. Manitowocs cost less to operate . . . are "down" less because they're built to take a generation of tough quarry punishment.

Review for a minute these reasons why a Manitowoc in your pit returns the most for your investment. Here are sure-footed crawlers with a huge, one-piece carbody mounted right on the crawler frames . . . stays in perfect alignment even after years of hard rock work. Manitowocs have the most simple design of any big machine available, with fewer power-wasting gears; a well-balanced, compact main machinery deck; and heavy, rugged parts that last a long time without fixing. Powerful, reinforced shovel booms and rugged, twin dipper sticks are built to take it. The fast, positive chain crowd "bulls" the dipper into the pile for a full payload. Air controls make operation a cinch . . . let your men put out more per hour. Torque converter power take-off balances power to the load — is easier on man *and* machine.

But words don't mean a thing without the real thing to back them up . . . and Manitowocs have the stuff, all right! Send for a copy of the informative booklet, "Manitowoc for More Profitable Production" and see for yourself what we mean.

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

SHOVELS AND DRAGLINES, 1¼-6 YDS. • CRANES, 25-125 TONS

Now SKF has improved the spherical roller bearing it invented!

This new spherical roller bearing offers even higher capacity than SKF's original, self-aligning bearing – and meets the needs of today's faster, more productive machinery. In some cases, the increase in capacity is as much as 54% – corresponding to more than 4 times longer service life!

Here's how these improvements have been obtained:

1. Eliminating undercuts and integral flanges – helps provide space for larger rollers and longer effective contact between rollers and races.

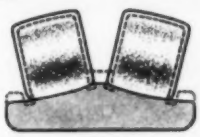


Fig. 1

Fig. 2

2. Using symmetrical rollers, unrestricted by flanges – ensures uniform load distribution over the roller length at all times, even under heavy thrust load.

3. Using an axially floating guide ring – provides effective roller guiding, and minimizes friction at roller ends.

Fig. 3

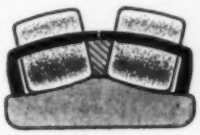


Fig. 4

4. Using a strong "window-type" cage for each row of rollers—helps ensure dependable operation over a full range of loads and speeds.

5. Placing a lubricant duct in the center of the outer ring—helps channel lubricants directly to the rollers and push contaminants away.

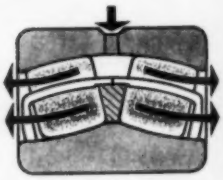


Fig. 5

For full details on this new high-capacity spherical roller bearing call the nearest SKF sales office or authorized SKF distributor listed in the yellow pages of the telephone book.

5931

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U. S. PAT. OFF.

PANGBORN DUST CONTROL REPAYS COST WITH PROFIT IN A YEAR!

Pangborn Dust Collectors save National Lead over $20,000 in recovered dust first year

The Baroid Division of National Lead Co., Houston, Tex., produces additives for use in oil well drilling mud. Because the dust resulting from crushing, grinding and bagging operations could be unpleasant for employees and surrounding neighborhood, National Lead installed a Pangborn Cloth Bag Dust Collector and a Pangborn Self-Cleaning Unit. Today management is enthusiastic over results! Not only have good employee and community relations been maintained, but Pangborn Dust Control has paid off in dollars and cents. In just the first year of operation, the two Pangborn Collectors salvaged enough dust to pay for both the collectors and installation and return a substantial additional saving to the company.

If dust is a problem in your plant, talk to the Pangborn man in your area or write PANGBORN CORPORATION, 5300 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment—Rotoblast® Steel Shot and Grit.*

Pangborn CONTROLS DUST

Enter 160 on card, page 155

Legal Decisions

(*from page* 150)

It is important to observe that the higher court promptly reversed this decision, and said:

"We think the lower court overlooked the evils to be remedied by the act—*i.e.*, to prevent a business from destroying competition by depressing prices in one locality where there is competition and offsetting the loss by raising the prices in another locality where there is no competition. The purpose of the act is to safeguard against the creation or perpetuation of monopolies and to foster and encourage competition by prohibiting unfair and discriminatory practices by which fair and honest competition is destroyed or prevented."

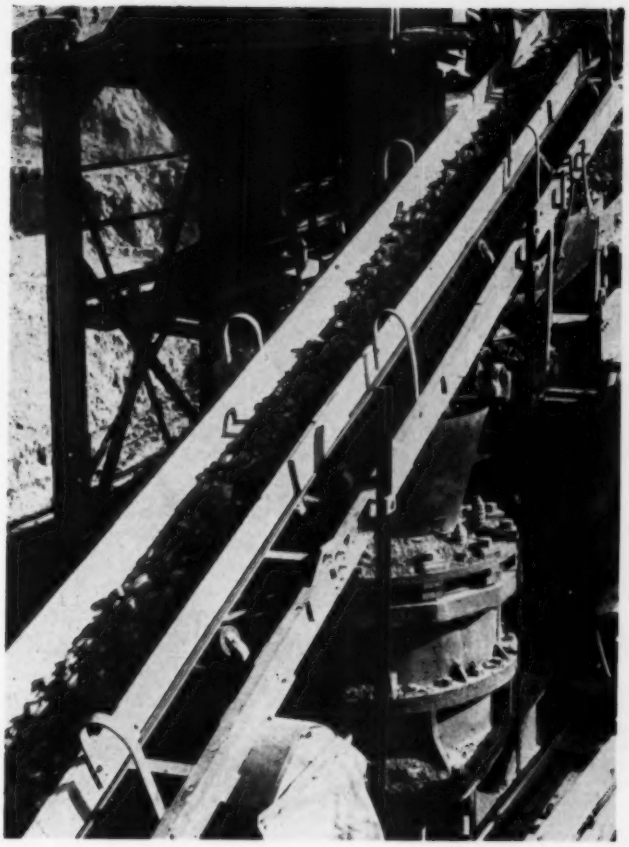
For comparison, see *Supreme Court of Nebraska,* in *State v. Drayton,* 117 N. W. 768, 770, 23 L.R.A.N.S. 1287. This leading higher court upheld the validity of a state law which prohibits monopolies. This higher couprt explained that it is common knowledge that certain corporations, firms, and persons had depressed prices of merchandise in one locality where there was competition and increased prices in other areas where there was no competition, thus avoiding loss, until the competitor was driven out of business, after which prices would be raised.

This higher court went on to explain that the intention of the legislatures in various states is to prevent that course of conduct if resorted to for that purpose. This court said:

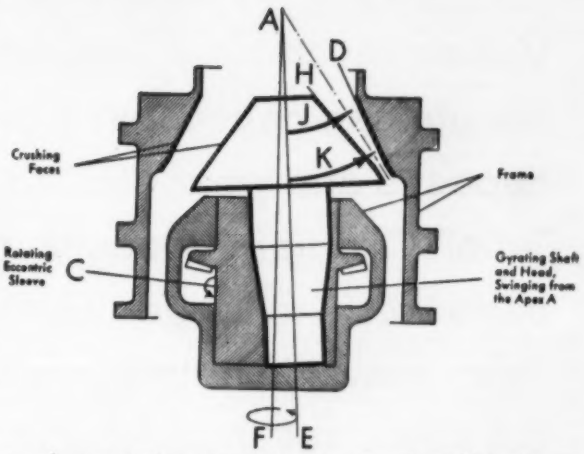
"It would be easily within the range of possibilities for one person or corporation to practically control the whole commerce of a community, a county, or even the state, exacting such prices as greed might dictate, and yet seeing to it that no others should be allowed to engage in a similar business as competitors."

An estimated 30,000,000 tons of sand and gravel in a deposit located 15 miles west of Rosamond, Calif., was recently acquired by the Fred Kennedy Company of that city. The deposit was used during the early 1900's for the construction of much of the Los Angeles Water and Power aqueduct.

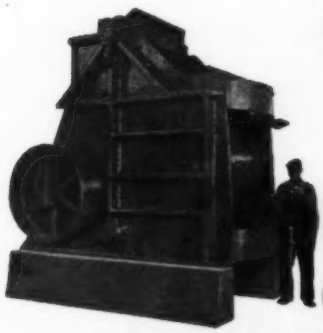
40,000 tons of hard rock handled by KUE-KEN® GYRATORY CRUSHER on original liner



By eliminating the upward abrasive action that quickly wears out liners in conventional crushers, KUE-KEN "crushing without rubbing" gyratory at Gallagher & Burk, Oakland, California, has operated for over a year with but a single replacement of the liner. Installed originally to eliminate the 8 hour loss out of every 48 in downtime for building up rolls, KUE-KEN has operated continuously and increased output 17% with plant production between 100 and 200 tons per hour. Compact in size and taking choke feed, KUE-KEN makes economical gyratory crushing practical in flow sheets where headroom is limited. Though exceedingly strong, KUE-KEN weighs less yet has larger shaft and bearings. For permanent or portable installation.



See how KUE-KEN crushing faces pass through crushing zone on arcs J and K to crush rock squarely without rubbing liners.



WRITE FOR CATALOG

KUE-KEN® CRUSHERS

"Crushing without Rubbing"

STRAUB MFG. CO., INC. 8381 Baldwin St., Oakland 21, Calif.

Jaw Crushers — Gyratory Crushers — Overhead Eccentric Crushers
Revolving Screens — Classifiers — Feeders — Rib Cone Ball Mills
Concentrating Tables — Vibrating Screens

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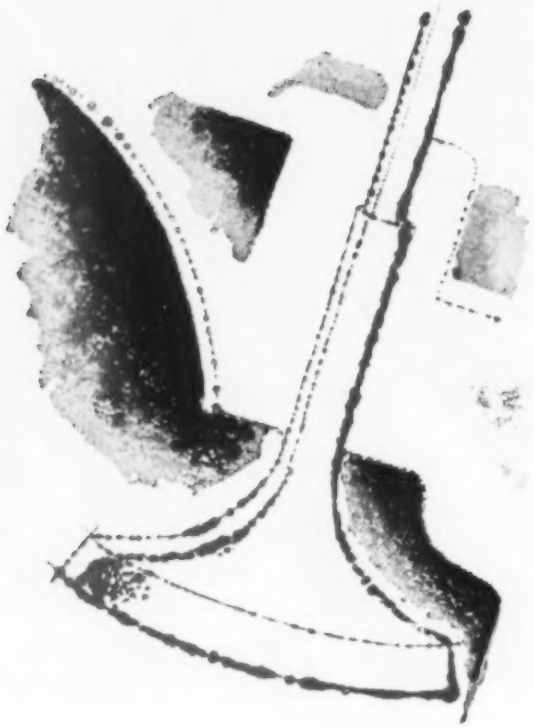
SALT LAKE CITY, UTAH ..... Lund Machinery Co.
SAN ANTONIO, TEX. ..... Closner Equipment Co.
LOS ANGELES, CALIF. ..... Garlinghouse, Fremon Co.
SAN FRANCISCO, CALIF. .... Aggregates Engineers, Inc.
PORTLAND, OREGON ..... Air-Mac, Inc. of Oregon
BISMARCK, NORTH DAKOTA .... Midwest Equipment Co.
PHOENIX, ARIZ. ..... Road Machinery Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England



Valves... Oil... and How to Save Money

Valves which open and close hundreds of times a minute can cause lost money, time and power when deposits and wear start to take their toll. Sinclair Tenol® Oils fight deposits and wear—help keep vital parts working longer without repair. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

Sinclair

Sinclair Tenol® Oils

Manufacturers' News

R. B. Utt

Ralph B. Utt, 51, vice-president and executive chief engineer of the Western Machinery Company of San Francisco, Calif., died recently. Mr. Utt had been associated with the Western Machinery Company and Western-Knapp Engineering Co. for nearly 20 years.

Born in Mansfield, Wash., he was reared near the Coeur d'Alene, Idaho, mining area, where he developed a life-long interest in the mining industry. He attended the Montana School of Mines and was graduated from the University of Idaho's School of Mines in 1934. Mr. Utt gained wide experience in mining throughout the Northwest, first as superintendent of the Glacier Silver-Lead Mining Company and later the Gem Mining Company.

Throughout his lifetime Mr. Utt took an active part in the affairs of the mining industry and the closely related concrete aggregate industry. He served as a member of the executive committee of the San Francisco Section of the American Institute of Mining and Metallurgical Engineers.

He was vice-chairman and most recently vice-president of the National Sand and Gravel Association's Manufacturer's Division. He was also a member of the American Mining Congress; Mining Section of the San Francisco Chamber of Commerce; and served as Secretary of the Minerals Section of the Commonwealth Club.

CLARENCE F. ABRAHAM died recently in Chicago at the age of 64. In 1932, with four others, Mr. Abraham formed the Screw Conveyor Corporation with plant and offices at Hammond, Ind. He was vice-president and director of the company.

FRED A. PAMPEL, 61, assistant sales manager of the conveyor equipment section, Chain Belt Company, died recently in Milwaukee, Wis. Mr. Pampel joined Chain Belt in 1925 as an estimator. He was appointed a sales engineer in 1934, and became assistant sales manager of the conveyor equipment section in 1952.

Mr. Pampel was active in the Manufacturer's Division of the National Crushed Stone Association; and the Paper Industry Management chapter of the American Material Handling Society.

F. A. Pampel

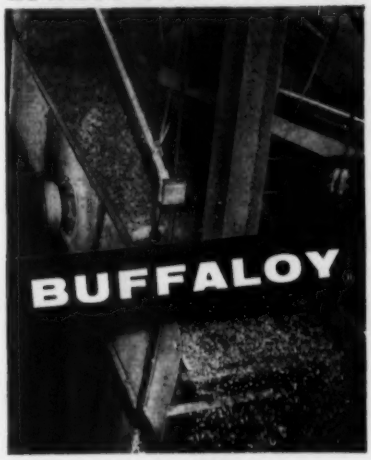
A. Kauffmann

ALFRED KAUFFMANN, a former president and long-time director of Link-Belt Company, died in Chicago at the age of 79. Mr. Kauffmann was born in Germany and came to this country when he was 5 years old. In 1901 he joined Link-Belt Company's Philadelphia plant as a draftsman, and in 1913 was brought to the company's general offices in Chicago as assistant to the president.

Elected to the presidency of the company in 1924, Mr. Kauffmann served as president until 1932, and again from 1936 to 1943 when he retired. He was a director of the company for 37 years.

Perfection Equipment Company, Inc., Oklahoma City, Okla. is a new distributor for the *New Leader* line of Highway Equipment Company, Cedar Rapids, Iowa. The new distributor will serve all of Oklahoma with the exception of 9 counties in the southeastern section of the state.

LONGEST SERVICE AT
LOWEST COST PER TON

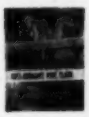


anti-abrasive wire cloth

Here's the toughest mineral aggregate screen in the business . . . outperforming and outlasting screens that cost appreciably more. Specially processed for greatest resistance to wear, Buffaloy has both the hardness to hold up under severe abrasives and the flexibility to shrug off heavy shock loads.

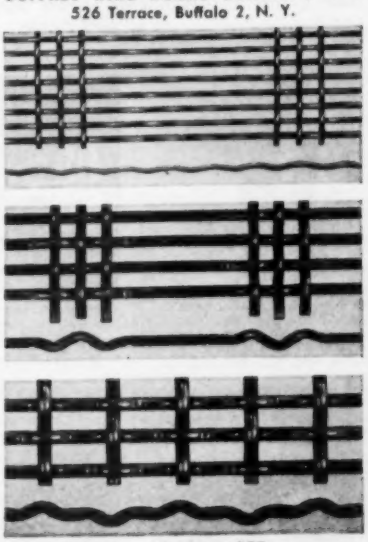
Count on Buffaloy for many extra hours of service and substantial savings in your screening operations. Vastly superior to other high carbon wire screens, it is made in two grades:
Regular . . . for average conditions.
Super . . . . for highly abrasive materials.

Now available in an extra wide selection of weaves, mesh sizes and gauges — either as flat pieces or vibrator screen panels with special edges — Buffaloy can answer your every sizing need.



Get the complete story on Buffaloy and what it can do for you. Write for New Bulletin 600P.

BUFFALO WIRE WORKS COMPANY, INC.
526 Terrace, Buffalo 2, N. Y.



Enter 163 on card, page 155

New power! New design! New features! Plus a new drive option—Cat power shift transmission! The result: higher production on any application!

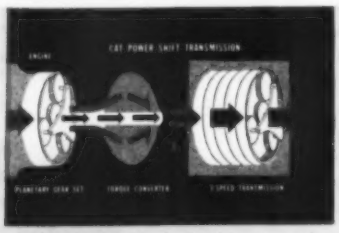
Now the "King of the Crawlers" is better than ever with new pace-setting capacity for higher, faster, lower-cost production on *any* big tractor application!

The biggest "new look" in the giant D9 Series E is the undercarriage. It's more massive . . . more rugged than ever. It'll add hours of life to running gear on even the toughest jobs. *Every* track component is new in design, highlighted by a big, new link—its pitch is increased 1¼" to 10¼"! And a new Caterpillar-developed steel alloy strengthens links, shoes, rollers *up to 40%!*

That's not all: the new D9 packs more power—335 HP. Its new equalizer bar gives greater stability on any terrain for greater operator confidence and production. A wider seat with a new spring-loaded adjustment mechanism makes the operator more comfortable, more efficient. No detail has been overlooked to make the new D9 handle heavier loads faster—and at lower operating and maintenance costs than ever.

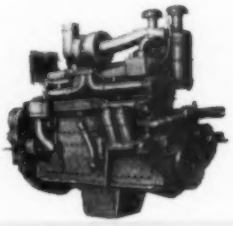
And that's not all. Now, along with direct drive and torque converter, you have your choice of the new Cat

Dry-type air cleaner. Removes at least 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Reduces maintenance time and cost.



Exclusive feature. A planetary gear set splits the power from the engine. Part goes directly to the 3-speed transmission, the rest goes through a torque converter to transmission.

New sprocket. Sprocket is strengthened by new design with increased tooth thickness. Hunting tooth action provides slower wear rate.



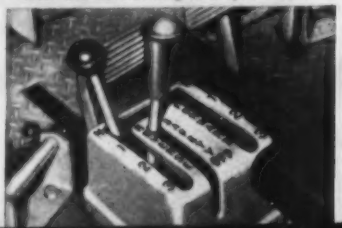
New 335 HP. More powerful than ever, the D9's Turbocharged Engine has the capacity to handle bigger loads faster, with dependability, economy.

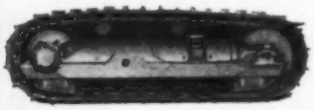
New Turbocharger. New, compact turbocharger packs more air into the engine. Open impeller wheel (shown below) helps prevent dirt build-up.

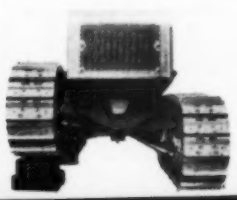
New power shift transmission. Optional on the D9. With this development you can shift **on-the-go** under **full** load with **one** lever and **no** clutching in a split second!

New, bigger, more rugged undercarriage. Major improvements in all track components add hundreds of hours of life to running gear—hours that mean more time on the job.

New equalizer bar. Greater stability. The rocking action of the bar shifts more weight to the up-hill track.







new CAT D9 E Tractor

power shift transmission. This revolutionary transmission, tested under the most rugged conditions, combines for the *first* time the positive feel of direct drive with the flexibility and anti-stall features of torque converter. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a split second!

Many of the new features, along with some familiar retained features, are shown here. Look them over. They'll give you an idea *why* the new D9 can mean higher production and more profits for you. For complete facts, see your Caterpillar Dealer. Ask for a demonstration and watch this giant eat up the work!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR'S No. 1 PROJECT

CATERPILLAR'S NUMBER ONE PROJECT A multimillion-dollar research and development program — to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

CATERPILLAR

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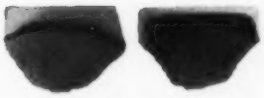
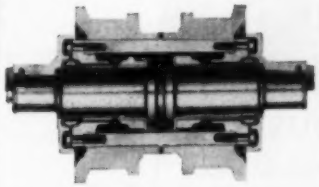
NEW D9 SERIES E— BORN OF RESEARCH PROVED IN THE FIELD



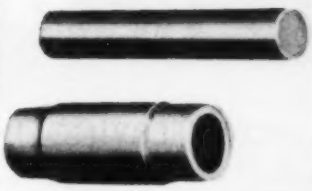
New track link — Previous track link

Light area at top indicates depth of hardening

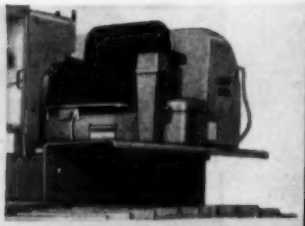
New deep hardening steel. Caterpillar-developed steel alloy (plus more steel in stress areas) gives up to 40% longer life to track shoes, links and rollers.



Lifetime lubricated track rollers. Lifetime lubrication eliminates servicing problems. Oil is retained by dirt-proof, floating-ring seals.



Larger pins and bushings. Diameters are ¼" larger. Increased size reduces deflection and provides better contact along the length of the wear surfaces.



New seat adjustment. New spring-loaded adjustment mechanism provides more positive cushion and back rest positioning. Wider seat for more comfort.

Better visibility. Redesigned fuel tank gives better visibility to the rear and tapered hood offers unexcelled forward vision.

Stronger track shoes. New alloy permits deeper hardening in wear areas. Grouser height is increased ⅜" for better penetration and prolonged service life.

New foot decelerator. Provides easier machine positioning. Allows deceleration without taking hands from controls (optional on direct drive, standard on others).

Bigger, heavier track links. Strength has been added in stress areas. Pitch increase from 9" to 10¼" strengthens all track components.

The election of J. H. BURLING to the office of secretary-treasurer of Fuller Manufacturing Company, a subsidiary of Eaton Manufacturing Company, Cleveland, Ohio, has been announced. Mr. Burling also was elected secretary of the Shuler Axle Company, Louisville, Ky., a wholly-owned subsidiary of Fuller. The new secretary-treasurer, who had served as assistant comptroller of Fuller Manufacturing Company since joining the company in 1950, fills the vacancy created by the death of ERIC A. PULLAN.

ALFRED CUTLER, who for the last 8 years has been European manager of Hewitt-Robins, Inc., Stamford, Conn., has been appointed manager of international operations, H. K. Porter Company, Inc. He will spend the next several months in England and on the Continent making an intensive study of potential sales and manufacturing outlets for the company's products. While in the United States, he will work out of the Porter New York offices.

The Gilman Paper Company has announced the placing of a contract for the erection of a modern converting plant of approximately 300,000 sq. ft. in St. Marys, Ga.

This new building will house under one roof the combined multiwall bag plants, and other converting operations of the Kraft Bag Corporation, subsidiary of the Gilman Paper Company.

This converting plant will receive its paper from a wholly-owned subsidiary of the Gilman Paper Company, the St. Mary's Kraft Corp., which produces 800 tons of bleached and unbleached paper and pulp a day.

ARNATH W. KNABE has been named manager, industrial development of the Baltimore and Ohio Railroad, with headquarters at Baltimore, Md. He was promoted from assistant manager of the department, to succeed GAYLE W. ARNOLD, who has retired. STANLEY A. TEMPLE, formerly assistant to the manager, industrial development, succeeds Mr. Knabe as assistant manager.

V. M. HOLLOWAY was appointed to the newly created position of general sales manager, Construction Machinery Division, Allis-Chalmers Manufacturing Company, Milwaukee, Wis. Mr. Holloway joined Allis-Chalmers as a student engineer in 1937.

A. E. DORN, who has been sales manager for the Division, takes over the newly created post of manager of sales training, headquartering at the company's Springfield Works. He joined the company in 1934.

J. M. HAILE, formerly assistant sales manager of the Division, was appointed assistant general sales manager, a newly created position. He has been with Allis-Chalmers since 1939.

K. A. NEW was appointed to another newly created position, as manager of dealer development. He began with the company's Memphis, Tenn., branch in 1941.

L. D. MYERS succeeds Mr. New as eastern region sales manager after serving as Construction Machinery branch manager at Memphis. He joined the company at Minneapolis in 1937.

L. D. CRAGGS, Division sales manager at Memphis, succeeds Mr. Myers as branch manager there. Mr. Craggs joined Allis-Chalmers in 1955.

The Eddy-Walker Equipment Company has been established in Des Moines for the sale and rental of heavy equipment in Iowa. Owners O. ROBERT EDDY and J. DUANE WALKER will handle Northwest Engineering Company cranes, shovels, and draglines; Seaman-Andwall Pulvimixers, rollers, and spreaders, and Gardner-Denver Company air compressors and air tools. In addition to the Des Moines warehouse, rental equipment is housed at Mason City.

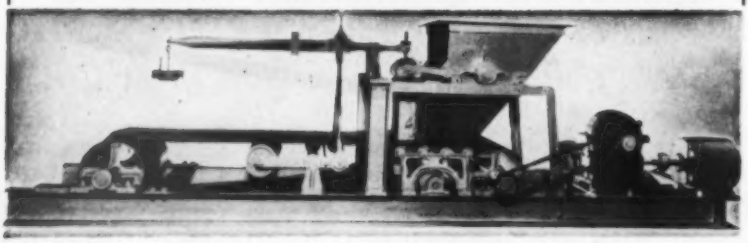
Leader Equipment Company, Spokane, Wash., is a new distributor for the *New Leader* line of Highway Equipment Company, Cedar Rapids, Iowa. Leader Equipment will serve the State of Washington, the State of Oregon, except Malheur County, and the upper ten counties of Idaho north of Idaho County inclusive.

SPEEDY — **ACCURATE**

SCHAFFER POIDOMETERS

insure top tonnages and profits

for BULK MATERIAL HANDLERS



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Here's positive insurance against costly delays in weighing, blending, feeding, mixing, recording or proportioning bulk materials.

These operations are handled to perfection by SCHAFFER Poidometers—the dependable scales that eliminate production line tie-ups and establish product uniformity.

Poidometers are engineered and constructed for trouble-free, economical service. They're available with remote control devices for showing and changing feed rate, and total weight recorders.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman St., Pittsburgh 22, Pa.

AUTOMATIC — **DURABLE**

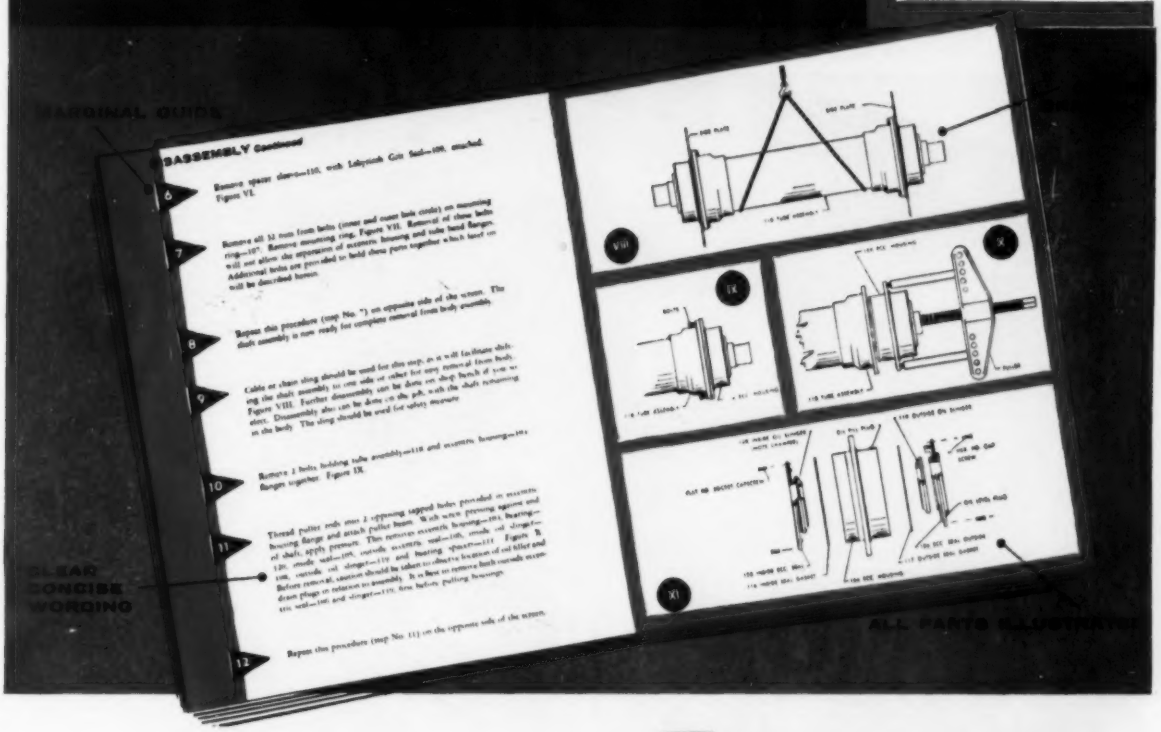
Enter 166 on card, page 155

HERE ARE MAINTENANCE SERVICE MANUALS DESIGNED WITH YOU IN MIND!

OPERATION

SCREENING

EFFICIENCY



Why did we take such pains to prepare clear, concise illustrated maintenance manuals for SECO screens?

That's easy to answer . . . it's another example of our recognized responsibility to you . . . to help you get the maximum performance from your SECO screens with the minimum of downtime.

We build SECO screens to give you high tonnages of accurately sized materials and to stand up when the going is tough. These manuals show you how to install and maintain this equipment for best results. There's nothing left to chance . . . when it comes to serving SECO customers.

SCREEN EQUIPMENT COMPANY Inc.

BUFFALO 25, NEW YORK

GET SET NOW FOR GREATER SCREENING EFFICIENCY

Put rugged, high tonnage SECO screens on your job. Today's requirements for volume screening of clean, accurately sized materials make it a must for you to invest in the best equipment made. That means SECO . . . over 500 models 4-Bearing and TWIN BEARING VIBRATING SCREENS.

Send for 4-BEARING CATALOG NO. 204 OR TWIN BEARING BOOKLET TB-21

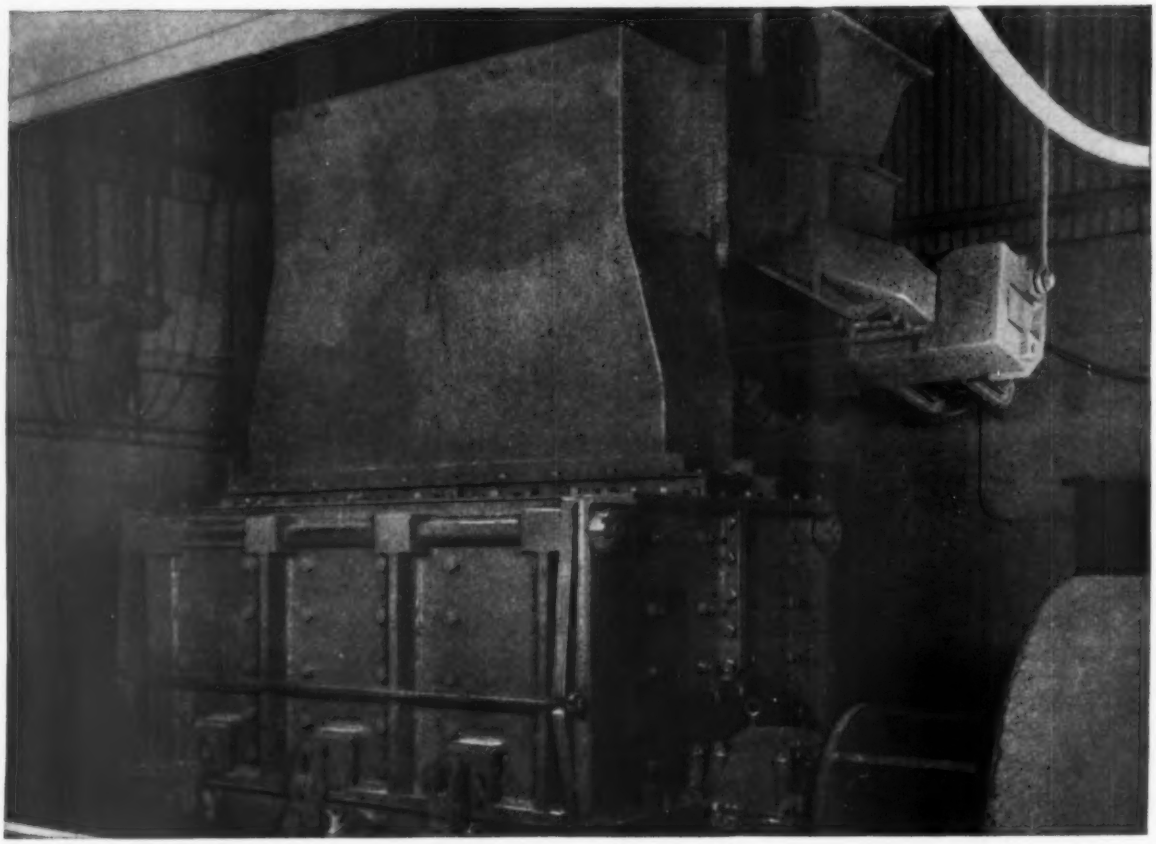
SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

"We're very well pleased with our Jeffrey crusher"

reports South Dakota State Cement Company



42" x 82" Jeffrey Type B Reversible Impact Swing Hammer Crusher mill at South Dakota State Cement plant, Rapid City, South Dakota. Crusher is fed by 5' x 6' Jeffrey enclosed electric vibrating feeder.

350 to 400 tons of limestone per hour are reduced by this Jeffrey crusher to ¾" x 0" size. The chief engineer for this plant says they are well pleased with this crusher and its Jeffrey feeder.

This reversible swing hammer crusher is the outgrowth of many years of experience in reducing cement rock and limestone to a product suitable for tertiary or fine grinding mills. Jeffrey engineers designed it to produce the most efficient product size for operation at peak capacity, with minimum upkeep and power usage.

Bulletin 868 describes this crusher. For a copy, or for help in solving any reduction problem, write The Jeffrey Manufacturing Company, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

JEFFREY

George W. Boulter has been named assistant manager of the mining division of Marion Power Shovel Company. Mr. Boulter was formerly safety director of the Montana State Highway Department, and has over 20 years' experience in various operating capacities in the non-ferrous metal mining industry.

G. W. Boulter

H. J. Gisler

H. J. GISLER has been appointed manager of the eastern sales division of Denver Equipment Company, Denver, Colo. Mr. Gisler, who has been with the company since 1937 leaves the post of chief metallurgist, a position he has held for the past 15 years. Incorporated in his new sales responsibility are 19 eastern states.

The Denver Equipment Company office in New York City which is managed by E. R. MORGAN will also be under Mr. Gisler's supervision.

ALBERT W. ELLIOTT has been promoted to manager of special purpose tire sales for The General Tire & Rubber Company's Denver division. He will be in charge of the sale of General's line of off-the-road giants in eight western States, including Colorado, Montana, Utah, Wyoming and parts of Nebraska, Nevada and North and South Dakota. Formerly Denver territory salesman, Mr. Elliott has been associated with General Tire since 1956.

Bucyrus-Erie Company, South Milwaukee, Wis., announced the appointments of CHARLES B. BROCKMEYER as sales engineer, dragline buckets and dippers; and FRANK T. HOUSE, sales development manager. Both men are headquartered at the main office.

H. C. LAWLESS, vice-president and director of sales for Gilman Paper Company and its subsidiaries, St. Marys Kraft Corporation and Kraft Bag Corporation, has announced the appointment of H. D. WELLINGTON to the newly-created post of assistant general sales manager, with headquarters in New York. Mr. Wellington formerly was western sales manager, located in Gilman Paper Company's Chicago office.

J. S. RITTER, formerly assistant, becomes western sales manager, with headquarters in Chicago. J. J. MCDERMOTT becomes Mr. Ritter's assistant.

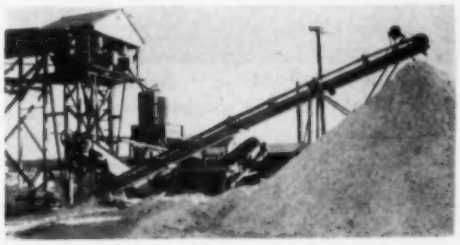
GEORGE E. BOWLING has been promoted to manager of special purpose tire sales for The General Tire & Rubber Company's Cincinnati and Memphis divisions. He will headquarter in Memphis, Tenn. Mr. Bowling will have special responsibilities in the sale of off-the-road tires in the south-central United States, including southern areas of Ohio and Indiana.

DONALD W. LINDGREN, formerly chief mining geologist of the Northern Pacific Railway, and ERNEST K. LEHMANN, consulting geologist, have formed the firm of Lindgren & Lehmann, Consulting Mining Geologists, with offices in St. Paul and Minneapolis, Minn.

The firm will do consulting work related to geological surveys, mine evaluation, mineral commodity studies, raw materials acquisition problems, mine and mineral land management, mineral economics and mineral policies in both domestic and foreign areas.

A new installment sales plan to increase sales of Pettibone Mulliken Corporation's equipment to the pit and quarry, and allied fields has been inaugurated by the company. The plan will offer extended installment terms to industrial purchasers, and be administered by James Talcott, Inc., one of the nation's oldest financing institutions. It will be available from all 168 of Pettibone Mulliken's distributors.

THIS SILICA SAND PLANT
is just the place for
BROOK MOTORS



There is no finer motor built—yet, Brook A.C. Motors cost less. So, aggregate and crushed stone producers save when they buy a Brook motor—and they continue to save because maintenance is no problem. Built for all-weather operation under rugged conditions.

The busy Murray Sand Co., silica sand producers, Murray, Ky., has no time for shut-downs. They use Brook Motors to drive mills, washers, pumps and conveyors. Brook Motors are available in all standard enclosures, 1 to 600 H.P. Warehouse stocks, factory representatives and dealers coast-to-coast.

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BROOK MOTOR CORPORATION
3302 W. Peterson Ave. Chicago 45, Ill.
In Canada: Brook Electric Motors of Canada Ltd.
250 University Ave., Toronto, Ontario

SINCE 1904
BROOK MOTOR CORPORATION

Enter 169 on card, page 155

The formation of a new subsidiary company in Brazil was announced by Cummins Engine Company, Inc., Columbus, Ind. The new Brazilian subsidiary, under the direction of Cummins Diesel International Ltd., will carry the corporate title Motores Cummins Diesel Do Brazil Ltda, with headquarters in Sao Paulo, Brazil. In the near future this firm will begin local production of major parts for Cummins diesels and all parts will be interchangeable with U. S. parts.

REINHARD G. SCHEIBNER is manager, Brazilian Operations, with headquarters in Sao Paulo. His prior assignment was with Cummins in Sydney, Australia.

Two appointments to the field sales organization of the Trojan Division of The Yale & Towne Manufacturing Company have been announced. R. J. LYONS JR., of South Orange, N. J., will be the Trojan tractor shovel district sales representative in New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Kentucky, Ohio, and the southern portion of New York State.

ROBERT C. PETERSON of Littleton, Colo., will serve in a similar capacity in Montana, Wyoming, Idaho, Utah, Colorado, New Mexico, Arizona, and the Province of Saskatchewan in Canada.

The General Tire & Rubber Company, Arkon, Ohio, promoted WILLIAM Z. WEEMS to manager of special purpose tire sales for the company's Dallas and Houston divisions. He formerly headed up truck tire sales in the Memphis division. In his new position, he will have special responsibilities in the sale of off-the-road giant tires in Texas, New Mexico, Oklahoma and Louisiana.

GUNNAR E. GUNDERSON, president of Brad Foote Gear Works, has returned from a three weeks' trip to Moscow. A former president of the American Gear Manufacturers' Association, Mr. Gunderson was a member of the executives group which was present when Vice-President Nixon opened the American National Exhibit in Moscow.

A. Harris Barber Jr. has been named business development manager, central district by the Western-Knapp Engineering Co., San Francisco, Calif. Mr. Barber will represent the engineering and construction firm throughout most of the Midwest from his headquarters in Chicago. Before joining WKE, Mr. Barber was associated for 15 years with the Cherry Burrell Corporation.

A. H. Barber Jr.

H. W. Gaeckle

H. W. GAECKLE has been named vice-president and general manager of the Dracco Division of Fuller Company. He has been with Dracco for 22 years, and has served as general sales manager since 1950. Mr. Gaeckle is assuming active control of the division from GEORGE A. GIESELER who has been the chief executive officer of the company for the past 25 years. Mr. Gieseler will continue in a senior advisory capacity.

Braubach Equipment Company, San Antonio, Texas, is a new distributor for Highway Equipment Company, Cedar Rapids, Iowa. Braubach will distribute Highway Equipment's *New Leader* line in the southern tip of Texas, covering the territory south from Williamson County to Calhoun and south to the Mexican Border and west to Pecos, Jeff Davis, and Presidio Counties inclusive.

Wright-Thomas Equipment Company, Charleston, W. Va., has been appointed crane-excavator distributor by Bucyrus-Erie Company, South Milwaukee, Wis. The dealer's territory covers the state of West Virginia except the counties of Hancock, Brooke, Ohio, and Marshall.

A. E. DECKER is now manager eastern area, of the recently formed Defense Products Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. He will headquarter in Washington, D. C., where he has been manager of the Washington office, tractor group government sales department.

GEORGE O. PIERCE has been appointed manager, western area, with headquarters in Los Angeles. Mr. Pierce, who is a registered engineer in both electrical and mechanical fields, joins the company with a background in government engineering and procurement.

DALE R. SHEARBURN is now sales supervisor of the Central Area. For the past several years, he has been with the Springfield Works and Tractor Group Government Sales. For the present, Mr. Shearburn will headquarter at the home office in Milwaukee.

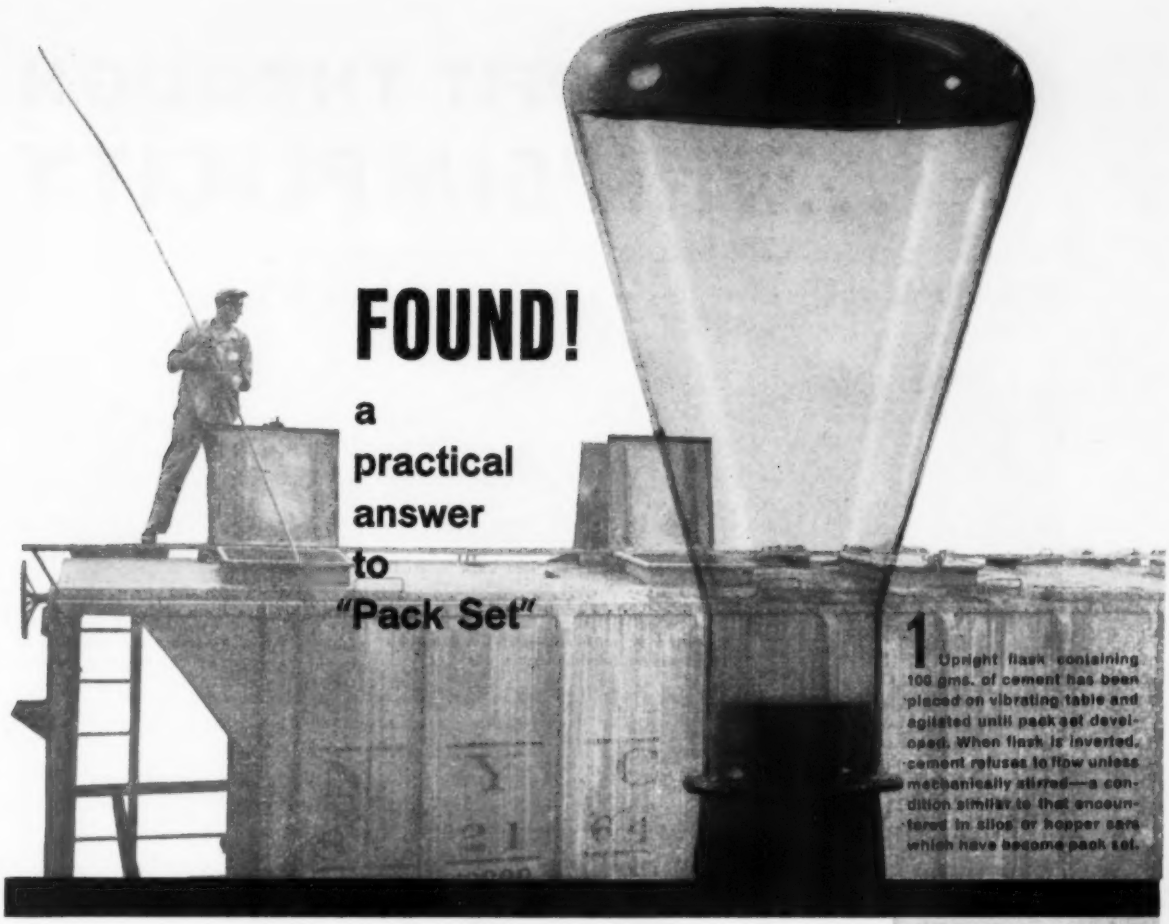
Three personnel changes within the eastern operations of the Bemis Bro. Bag Company, St. Louis, Mo., have been announced. R. V. SCOTT, director of eastern operations and company director, New York, will transfer to St. Louis as assistant director of sales for the company.

A. F. G. RAIKES, manager, New York general sales division, will assume Mr. Scott's duties as director of eastern operations, and will be succeeded by J. B. GOOLSBY, area sales manager at the Brooklyn sales division.

JOHN E. GABRIELSON is The Bristol Company's new sales engineer with headquarters in Salt Lake City to serve the Salt Lake City and Idaho Falls areas.

He has been with the company since 1956 and until his present assignment has been with Bristol's application engineering department at the home office in Waterbury, Conn.

Roberts Soil Service, Trinity, Tex., will distribute the *New Leader* line of Highway Equipment Company, Cedar Rapids, Iowa, in a 39 county area in east central Texas from Shelby County west to Milam and south to Jackson.



FOUND!

a practical answer to "Pack Set"

1 Upright flask containing 100 gms. of cement has been placed on vibrating table and agitated until pack set developed. When flask is inverted, cement refuses to flow unless mechanically stirred—a condition similar to that encountered in silos or hopper cars which have become pack set.

Dry dispersion with TDA

If you're paying good money to move "pack set" cement—or if your customer is—this message is meant for you.

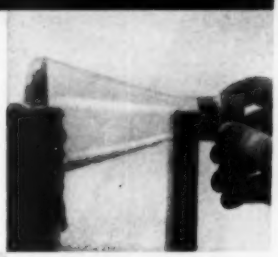
Pack set can be overcome *in the grinding operation.* The answer is Dewey and Almy's TDA, a dry dispersant.

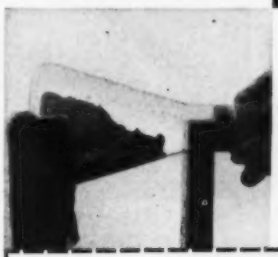
Accepted by ASTM as non-harmful to cement, this product has been in use as a grinding aid for nearly a quarter century. Its effectiveness as a *pack set inhibitor* has been clearly established by the test method illustrated in these laboratory photographs.

Get the facts about TDA and dry dispersion. Check the coupon now and evaluate TDA in your own operations.

W. R. GRACE & CO.
DEWEY AND ALMY CHEMICAL DIVISION
Cambridge 40, Mass.

2 Now flask is placed on horizontal axis and gently rotated in half-turns until cement is loosened and flows once more. Number of half-turns is termed "Pack Set Index".





3 Laboratory demonstrations, substantiated by field experience, show that cement interground with TDA has a Pack Set index one-third to one-fourth that of untreated cement . . . *flows three to four times more readily.*

Dewey and Almy Chemical Division, W. R. Grace & Co.
622 Whittemore Avenue, Cambridge 40, Massachusetts
Attention: Rock Products Chemicals Department

☐ Please forward the new TDA "Pack Set" Bulletin ☐ Please arrange a full-scale test grind in our plant

NAME.....
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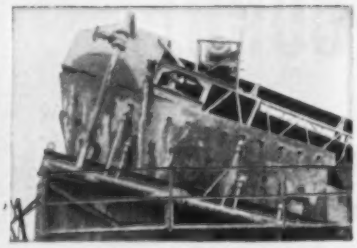
CITY.....ZONE.....STATE.....

PROFIT THROUGH ...WITH SIMPLICITY

A 4' x 12' and a 4' x 10' Triple Deck Model D Gyrating Screen, set in tandem, performs a final washing and sizing operation. The washed gravel is fed to five storage bins, so that any specification can be met by blending on the conveyor belt underneath these bins.



This Simplicity 5' x 14' Two Deck Model D Gyrating Screen takes its feed from the raw material stock pile via conveyor. All decks have washing sprays. The three products produced of sand and gravel are fed by conveyors to individual stock piles.

Aggregate is carried right from the pit to this Simplicity 3' x 8' Model BG Heavy Duty Scalping Screen. Fines are screened through to the conveyor below, while oversize is scalped to crusher.

ACCURATE SIZING GYRATING SCREENS

4,500 tons of aggregate a day is classified by four Simplicity screens at Holly Sand and Gravel, near Holly, Michigan

Working two shifts of 9 hours each, the Holly Sand and Gravel Company is daily processing 4,500 tons of aggregate, and the firm's General Manager expects to exceed this total in the near future. All this material is sized on four Simplicity screens. Simplicity Model D Gyrating Screens and a Model BG Scalping Screen efficiently and accurately classify the aggregate into grades 10A, 6A, Pea Rock, Torpedo Sand, and Mason Sand. This fast and accurate sizing is typical of the performance of Simplicity Screens throughout the aggregate industry. In addition, a 3' x 6' Model C Single Deck Screen has recently been installed to produce 100% clean Pea Pebbles, by eliminating the buckshot. The Simplicity Gyrating Screen is the original type of mechanically vibrated screen using the counterbalanced eccentric shaft. The counterbalance is machined directly on the shaft, thus giving positive action with perfect smoothness.

Simplicity Gyrating Scalpers are heavy-duty machines built on the same basic principles as the Gyrating Screens, but with a grizzly deck to scalp off the oversize rock. These units are designed to withstand terrific impact. They perform two jobs at once by feeding the oversize into a crusher, and screening the fines.

Wherever you need fast, efficient scalping, screening, or feeding in your aggregate operation, Simplicity equipment can be a big help to you . . . write us today for complete information.

Simplicity
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ENGINEERING COMPANY • DURAND 12, MICHIGAN

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FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

182

The appointment of THOMAS W. MORRISON as director of engineering and research for SKF Industries, Inc., has been announced. He joined SKF in 1936 as a machinist in the research laboratory.

The engineering division and the research laboratory were under the direction of vice-president GUNNAR PALMGREN, who is completing nearly 40 years' service to the company as he prepares for retirement. Mr. Palmgren will serve as vice-president and special consultant to the president through the end of the year.

Henschel-Werke G.m.b.H., Kassel, West Germany, 149-year old West European designer and manufacturer of many products including locomotives of any drive, trucks, buses, diesel engines, and pumps, will enter the United States market, and has appointed the Norca Machinery Corporation of New York City, N. Y., as its sales representative in the United States and Canada.

Diamond Iron Works, division of Goodman Manufacturing Company, Chicago, Ill., has three recent distributor appointments for the complete line of Diamond products. Clyde Everett Equipment Company, Burlington, Mass., and E. Providence, R. I., will have eastern Massachusetts and the entire state of Rhode Island for its territory.

Truck & Tractor Equipment, Ltd., Dixie, Ontario, Canada, will distribute in eastern Ontario. Industrial Suppliers, Ltd., Halifax, Nova Scotia, Canada, will serve Nova Scotia.

The appointments of CHARLES C. LUND and ROBERT H. WALKER as district sales managers for Joseph T. Ryerson & Son, Inc., Chicago, Ill., has been announced.

Mr. Lund has been with the company since 1911. He has served the Clearing industrial district and surrounding territory for 30 years. Mr. Walker joined Ryerson in 1946. For several years he has been working out of the company's Minneapolis district sales office.

G. W. PATERSON of Montreal has been re-elected vice-president and general manager of Refractories Engineering and Supplies, Ltd., of Canada, at a recent meeting of the board of directors held in Hamilton, Ont. Also selected were R. E. NOPPER, Hamilton, treasurer; F. E. MURGATROYD, Hamilton, secretary.

The Canadian firm, established in 1945, became a subsidiary of Kaiser Aluminum & Chemical Corporation in 1959. The company produces refractory specialty products at the plant at Bronte, Ont., and maintains stocks of refractory brick and specialties at its Montreal, Bronte, and Windsor warehouses.

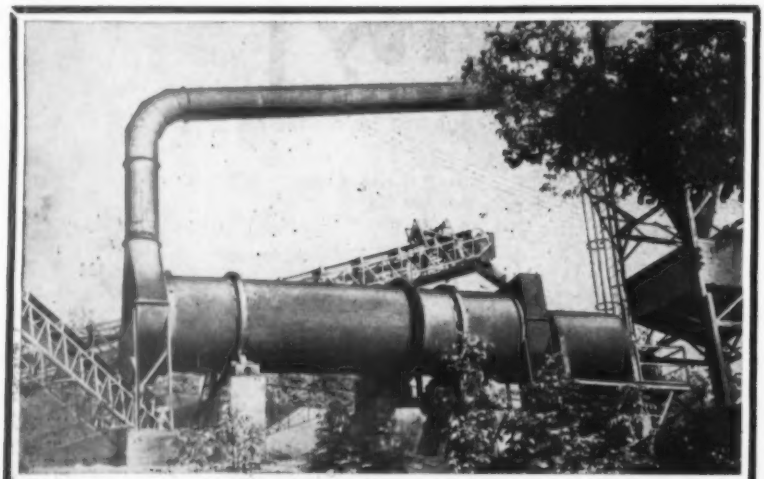
In addition to its own products, Refractories Engineering will continue to act as Canadian refractories distributors for Babcock & Wilcox Company, The Chas. Taylor Sons Company, and the International Vermiculite Company.

W. DAN SINCLAIR has joined Kaiser Engineers Division of Henry J. Kaiser Company as a power consultant. His specific assignment for Kaiser Engineers will include development activities in the power field, with particular emphasis upon utilities of medium size.

Mr. Sinclair is manager and chief engineer of the Crisp County Power Commission, and is particularly known for his achievements at Plant Crisp, the nation's first combined gas turbine-steam turbine generating facility.

CHARLES J. LLOYD has been named sales engineer for mining and aggregate screens by Cross Perforated Metals of National-Standard Company. Mr. Lloyd is based in Fairmont, W. Va., and will cover Virginia, West Virginia, Tennessee, Kentucky, southern Indiana, and southern Illinois. He had been a sales engineer with Fairmont Machinery Company for 7 years.

The appointment of JACKSON R. FITZGERALD as works chief industrial engineer has been announced by Bucyrus-Erie Company, South Milwaukee, Wis. He was a member of the industrial engineering corporate staff until named to his new position.



DRYERS • COOLERS • KILNS

This 7 ft. x 30 ft. Rotary Dryer removes excess moisture. Dryer is oil heated.

Over 60 years of experience and a thorough knowledge of raw materials and their properties have resulted in McDermott's ability to design and build for you the most efficient equipment for your specific needs. You'll save money on initial installation costs . . . and, more important, on maintenance costs.

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12 pages of diagrams, descriptions and on-the-job photographs to illustrate the scope of our work.

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H&L Teeth that really dig

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GIVE NEW LIFE TO YOUR DIGGING EQUIPMENT

FORGED HIGH ALLOY STEEL SHARP POINTS

Require less power – give greater production with longer digging life.

REPLACEABLE WEAR-PLATE ADAPTER

Wear-plate minimizes adapter wear. Simply replace wear-plate when worn and adapter is in new condition.

SEE YOUR H&L DEALER or write:

H&L TOOTH CO.
1540 SOUTH GREENWOOD AVE.
MONTEBELLO, CALIFORNIA

SPECIALIZING IN TWO PART TEETH FOR OVER 28 YEARS

The C. O. Bartlett & Snow Company, Cleveland, Ohio, has acquired the entire Wettlaufer line of vibrating screens, packing units, blender mixers, granulators and centrifuges. The line was developed by William L. Wettlaufer.

With this addition to its line of products, Bartlett-Snow reports it can provide equipment for drying, calcining, reducing, screening, mixing, and conditioning a wide range of materials.

HENRY D. HINEMAN has been appointed to the position of field engineer with SKF Industries Inc., Philadelphia, Pa. In his new post, Mr. Hineman will sell and provide technical assistance to customers in the Pittsburgh area. He was formerly a senior regional engineer with SKF central sales region.

P & R Truck Equipment Company, El Paso, Texas, is a new distributor for the *New Leader* products of Highway Equipment Company, Cedar Rapids, Iowa.

EDWARD C. BUURMA, formerly manager of product development of Sequoia Wire and Cable Company, has been transferred to the parent company, Anaconda Wire and Cable Company, New York, N. Y. Mr. Buurma will be active in promotional sales work related to Defense Program activities. He will temporarily maintain his headquarters at the Sequoia Wire and Cable Company mill, Redwood City, Calif.

Bailey Meter Company, Cleveland, Ohio, has appointed K. R. DODSON as resident engineer in Corpus Christi, Tex., subdivision of the company's Houston district. Mr. Dodson joined the company in 1952, and has been on the Houston staff since that time.

HUGH MULLEN has been appointed vice-president in charge of operations for Buell Engineering Company, Incorporated. He was formerly director of purchasing and administrative assistant to the president. He joined Buell in 1946.

BYRON K. HARTMAN has been appointed executive vice-president and general manager of Syntron Company, Homer City, Pa., a subsidiary of Link-Belt Company. Mr. Hartman, who has been sales manager of Link-Belt's Colmar plant outside Philadelphia, has been with the parent company since 1937.

B. K. Hartman

J. E. Challis

Barber-Greene Canada Ltd., Don Mills, Ont., has appointed JAMES E. CHALLIS, P. Eng., to the position of chief application engineer, Industrial Equipment Sales Division. He will be responsible for the handling of customer engineering problems, and for supervising the proper application of the Company's line of belt conveyors and associated equipment.

KENNETH M. SMITH has been promoted to manager of truck tire sales for the Arkon division of The General Tire & Rubber Company, Akron, Ohio. Mr. Smith has been engaged in sales work for the past ten years. His previous position with General Tire was Cleveland territory salesman.

The appointment of GEORGE H. BLANK as sales manager of Joseph T. Ryerson & Son, Inc., Buffalo, N. Y., has been announced by the company headquarters in Chicago. He succeeds Clive C. Earle who has assumed a similar post at the Ryerson plant in Philadelphia.

R. W. WILSON has been appointed to the position of manager of the Foundry Division of American Hoist & Derrick Company, St. Paul, Minn. He became assistant manager of the Foundry Division in 1958.

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal —no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300% —special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

• Open Gears, Dipper Sticks, Cams • Enclosed Gear Cases • Wire Rope and Cable
• Hydraulic Units, Torque Converters • Roller, Ball, and Sleeve Bearings • Speed Reducers

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

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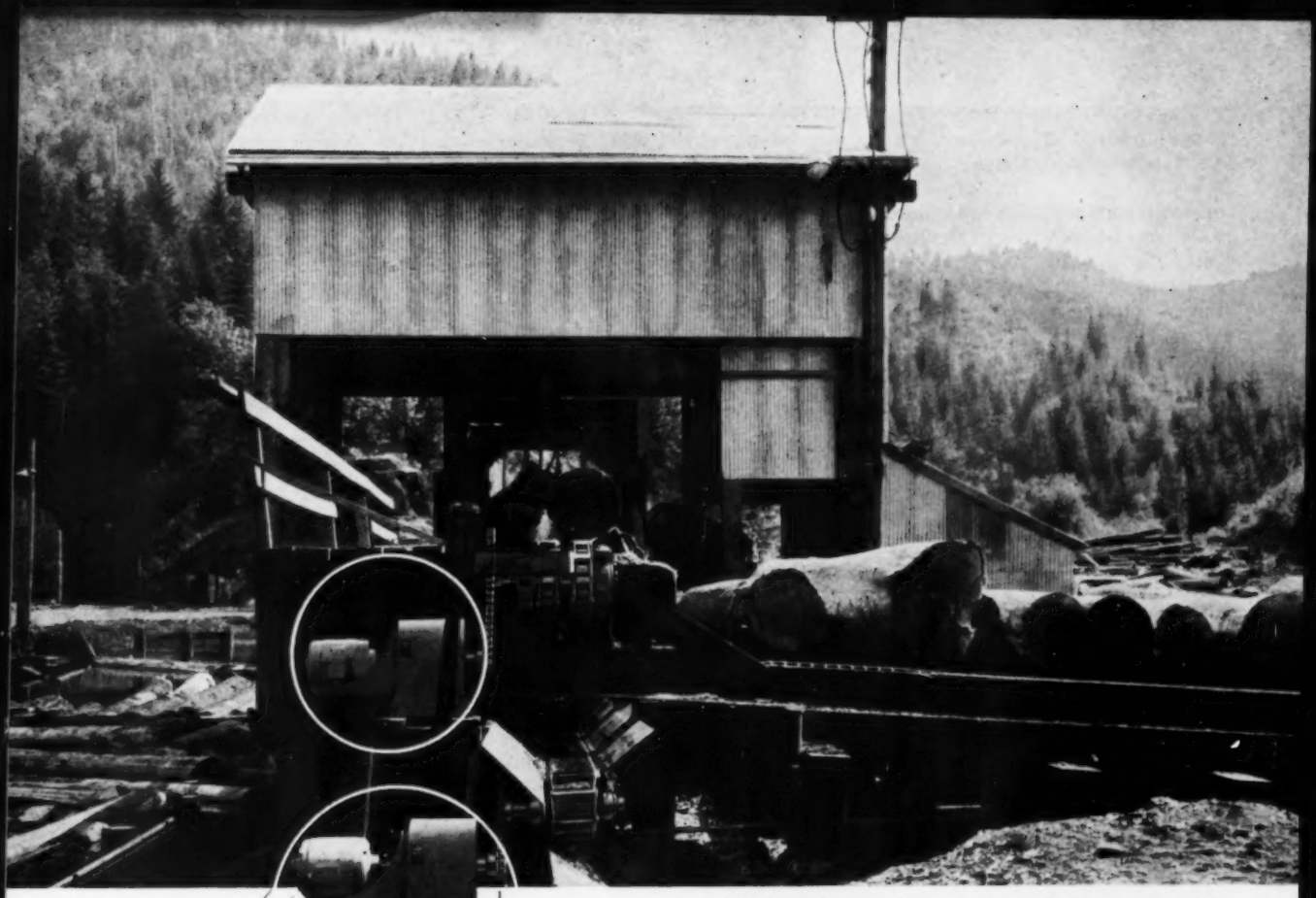

FALK Motoreducers driving log conveyor and refuse conveyor at the modern mill of The Bohemia Lumber Company, Culp Creek, Oregon.

FALK *all-steel* Motoreducers give you longer service life

Whether your load conditions are normal or heavy, the extra rigidity of all-steel construction (more than twice that of cast iron) maintains better alignment of revolving elements under load...a vital factor in prolonging the service life of gears and bearings.

And if your installations are subject to shock loads, or accidental external impacts, you're way ahead when you install Falk All-Steel Motoreducers. These rugged units do not destroy themselves by tearing off their feet under jamming overloads, nor are their housings subject to cracks which both dissipate the vital lubricant supply and allow revolving elements to get out of alignment.

All-steel construction is one of the built-in extras that you get in Falk Motoreducers. Others include: (1) 12 to 15% reserve load-carrying capacity in the gears (by AGMA standards), thanks to exclusive Falk extra-depth, high pressure angle helical gears; (2) maximum mechanical efficiency (98½% per gear mesh, under full load); (3) your choice of standard units (horizontal, vertical or right angle) to fit your precise requirements.

HORSEPOWER RANGE: to 75 hp . . . STANDARD OUTPUT SPEEDS: 780 rpm (high) to 1.2 rpm (low).

Prompt delivery from distributor stocks, or from warehouse or factory. Ask your Falk Representative or Authorized Falk Distributor for ***Bulletin 3100.***

THE FALK CORPORATION, MILWAUKEE 1, WIS.

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in most principal cities

FALK

. . . a good name in industry

Take your choice of all-steel drives when you specify Falk

THE FALK ALL-MOTOR MOTOREDUCER
...the original All-Motor unit

THE ALL-STEEL FALK SHAFT MOUNTED DRIVE

Torque ratings to 41,000 lb-in at low speed shaft. Also available in flange-mount design.

FALK and ALL-MOTOR are Registered Trademarks.

Diamond T Motor Truck Company, Chicago, Ill., has appointed seven new dealers for its line of heavy-duty trucks, all of whom maintain parts and service facilities. They are: Max W. Smith, Ballietsville, Pa.; Rocky Mount Trading Company, Inc., Rocky Mount, N. C.; Empire Equipment Sales, Kalispell, Mont.; Dean Powers Company of Rockford, Rockford, Ill.; Truck and Trailer Sales Corp., Savannah, Ga.; The Service Center, Mobile, Ala.; Merle Kelly Equipment Co., Kansas City, Mo.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, has announced the appointment of Reynolds Machinery Company, Omaha, Nebr., as distributor for *Lima* Austin-Western crushing, screening and washing equipment. Territory of the distributor includes nine counties in the state of Iowa and eight counties in Nebraska. Reynolds is also distributor for *Lima* shovels, cranes, draglines, pullshovels and the *Lima* Roadpacker vibratory compactor.

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CARRA L. LANE has been appointed manager of plant operations for the Chicago Pneumatic Tool Company. All manufacturing and engineering operations in the company's domestic plants at Utica, N. Y.; Franklin, Pa.; and Fort Worth, Tex., will be under his jurisdiction.

In addition he will coordinate operations at the company's wholly-owned subsidiaries: The Jacobs Manufacturing Company, West Hartford, Conn.; The Allen Manufacturing Company, Bloomfield, Conn.; and REICHdrill Division of Chicago Pneumatic Tool Company, Terra Haute, Ind. Mr. Lane's headquarters will be at the company's home office in New York City. He formerly served as president and general manager of the Security Engineering Division of Dresser Industries, Inc.

The Anderson Bolling Manufacturing Company, Grand Haven, Mich., has announced a change in the name of its Differential Wheel Division to *Bolling Wheel and Axle Division*. The change is effective immediately and embodies a new corporate image which will produce exclusively independently rotating dual wheels and has recently started the production of dual wheel front steering axles for heavy-duty trucks and off-highway equipment. These products are distributed nationwide through 72 distributors.

FRED E. FOGG, formerly production coordinator has been placed in charge of an expansion of Denver Equipment Company's foundry at Colorado Springs, Colo. He has been with Denver Equipment for two years and is experienced in foundry chemistry, technology, and casting control.

In addition to supplying castings for the company, the new program calls for foundry expansion and sale of castings to other firms in the Rocky Mountain Region.

F. LAWRENCE DOHERTY, assistant personnel manager of Stone & Webster Engineering Corporation, since 1951, has been promoted to personnel manager.

C. A. RICHARDSON, a sales engineer for Denver Equipment Company, Denver, Colo., for the last five years, has been transferred to Tucson, Ariz. Mr. Richardson will head a new sales and service program that includes southern New Mexico, Arizona, the El Paso area of Texas, and southern California.

C. A. Richardson

Donn Fraser

DONN FRASER has recently been appointed field representative in Canada by the Arcair Company, Eastern Division, Lancaster, Ohio. He will call on and work with Arcair distributors in all provinces of Canada with the exception of British Columbia.

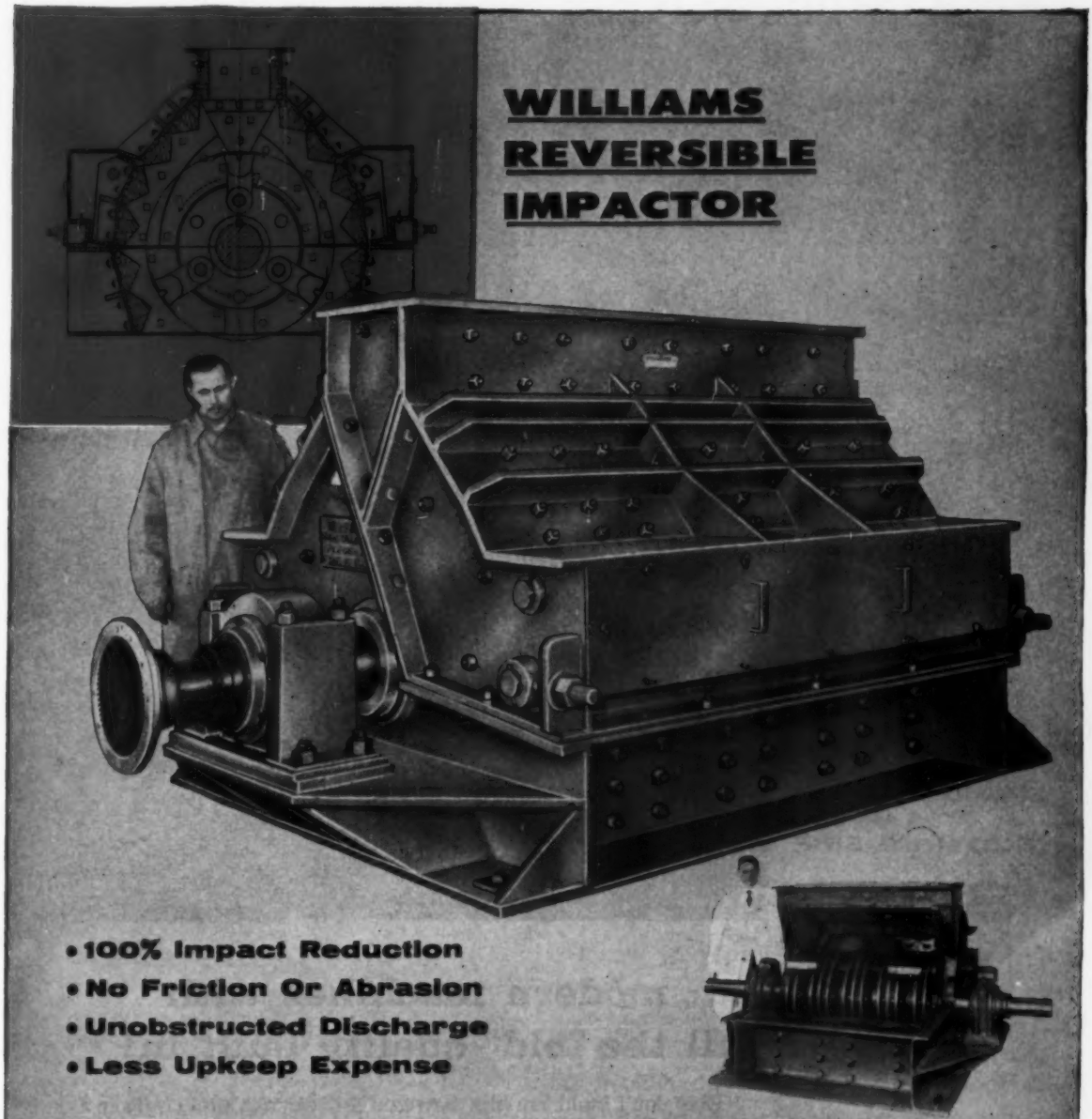
Mr. Fraser's background has been connected with the welding industry in its practical applications and as an instructor, both in Canada and in South America. He has worked for a short period in the United States.

Caterpillar Tractor Company has a 10½ minute 16 mm. color film demonstrating its new 225 hp. No. 619 Tractor with matched 18-cu. yd. heaped scraper. The manufacturer reports this model to be the latest addition to its line of high speed rubber-tired machines.

ROBERT L. KOOB has joined the Allis-Chalmers Manufacturing Company as director of public affairs, a newly created position. He will act as a consultant on government affairs to all divisions of the company.

Greenville Steel Car Company has announced that it will now market rippers, scrapers, loaders, and other related products under the trade name of *Greenville*. The *Ateco* trade name will be discontinued.

WILLIAMS REVERSIBLE IMPACTOR



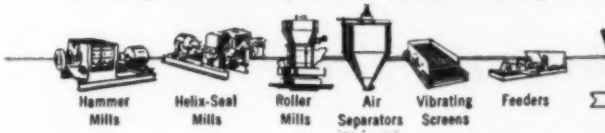
- 100% Impact Reduction
- No Friction Or Abrasion
- Unobstructed Discharge
- Less Upkeep Expense

Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

Unequalled For Secondary Grinding

Reduces limestone and material of similar hardness to 1½", ¾" or smaller. Properly adjusted, the Williams Impactor makes excellent material with the proper percentage of fines for road base course. Unusually low upkeep expense as reduction is 100% by impact. Material is fed to enter between the hammers and is thrown against the impact blocks setting up a repeated ricochet action which accomplishes the reduction. Adjustable impact blocks adjust for wear. A reversing switch on motor permits rotating hammers in either direction, to the left today and to the right tomorrow, thereby giving double hammer life. No grates are used. Entire bottom is open permitting unobstructed discharge of crushed material and less wear and tear. A size for every job. Let us tell you about one for your use.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
802 St. Louis Avenue — St. Louis 6, Mo.



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CRUSHERS · GRINDERS · SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

BUCYRUS-ERIE

30-B

SHOVELS

. . . modern machines with all the "old" quality built in!

"They don't build 'em like they used to!" *Oh, don't they!?* Take a good look at the Bucyrus-Erie 30-B shovel. Here's a machine as rugged as any ever built . . . and as modern — with an added tonic of speed, easier controls, and extra stability.

The old ruggedness comes from the 30-B's heavy-duty crawlers and revolving frame. The revolving frame, for example, is a one-piece steel casting with reinforcing ribs to add extra strength where heaviest forces are applied. Compare this to others with light-welded structural frames.

Modern speed comes from the 30-B's clean, efficient power train, and *graduated air controls!* They're used on drum and swing clutches and on the boom hoist to give you just the amount of air — and action — you want *when* you want it.

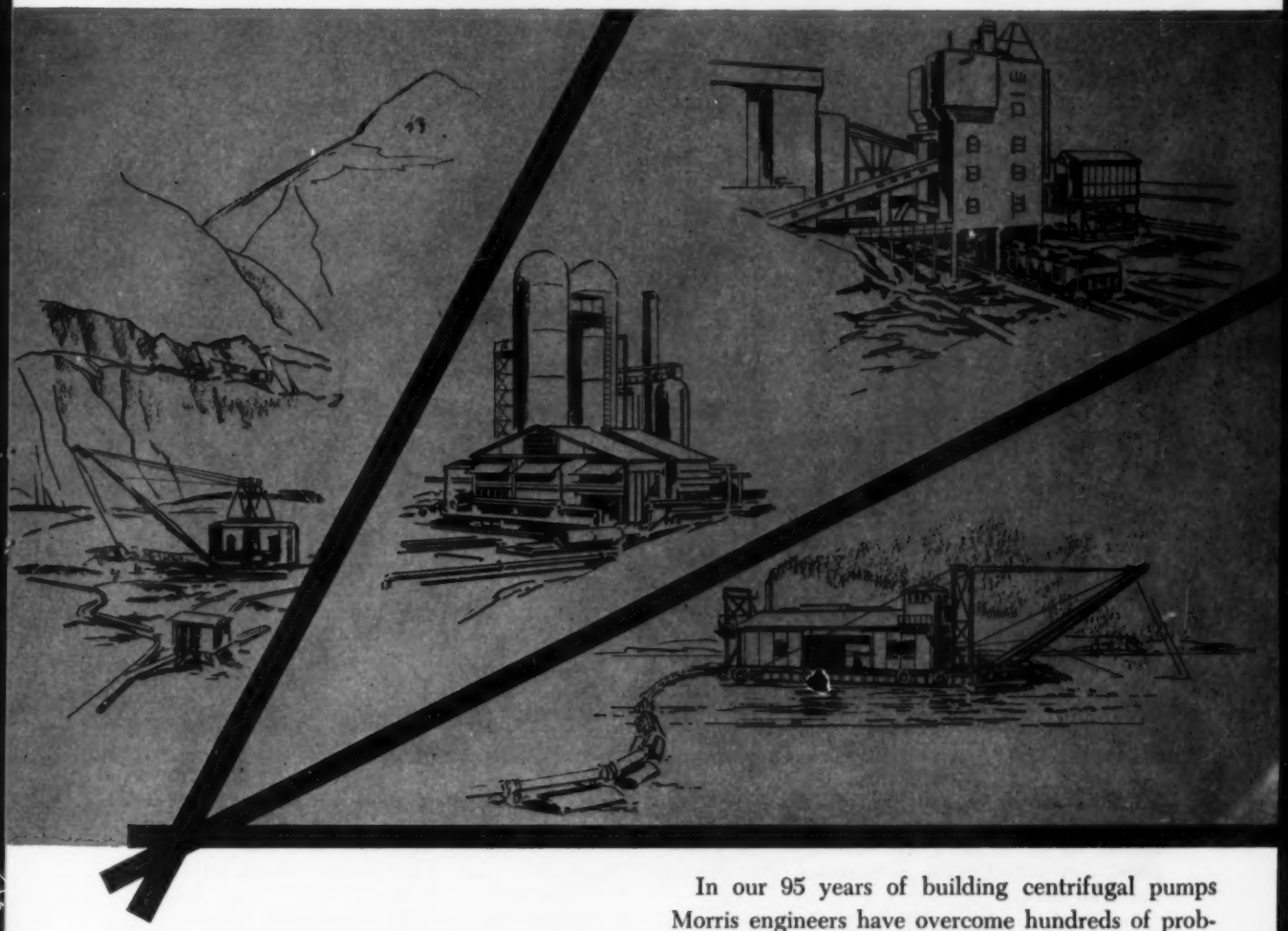
Get the complete story from your Bucyrus-Erie distributor today, or write to Bucyrus-Erie Company, South Milwaukee, Wisconsin, Dept. 48E.

BUCYRUS ERIE®

Builds Better Equipment

Where DEPENDABILITY counts in centrifugal pumps...

(and where doesn't it?)

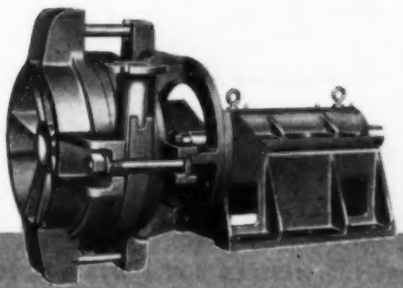


more and more users depend upon

MORRIS

In our 95 years of building centrifugal pumps Morris engineers have overcome hundreds of problems caused by the substances being pumped or by the required speeds, heads, maintenance, and other factors. Elements such as these and their handling under specific conditions are taken into consideration in *every* Morris pump supplied you.

Morris pump dependability relies, of course, on the usual factors of metallurgy, design and precision manufacture. But it also stems from the broader base of balancing the working parts of the pump against the conditions under which it must operate. You, the user, reap the full benefit of — *Greater Dependability.*



Type-RX Slurry Pump. A heavy duty, low speed slurry pump expressly designed to to handle abrasive slurries up to the maximum fluid consistency, under suction lift or positive head.

● Let a specially trained Morris sales engineer help you select the "just right" pump for your job.

MORRIS MACHINE WORKS • Baldwinsville, N.Y.

MORRIS CENTRIFUGAL PUMPS

SALES OFFICES IN PRINCIPAL CITIES • EXPORT OFFICE: 50 CHURCH ST., NEW YORK 7, N. Y.

FOOTE BROS. DRIVES IN THE SAND AND GRAVEL INDUSTRY

Barber-Greene Photograph

When Consumers Co. a division of Vulcan Materials Company, installed Foote Bros. LINE-O-POWER Drives* at its Crystal Lake, Illinois crushed gravel plant, they expected top performance. They got it, plus a lot more.

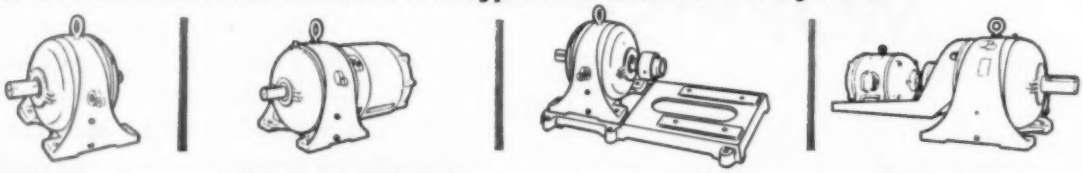
Designed to produce 450 tons of crushed gravel per hour, the Crystal Lake plant has consistently averaged more than 520 tons per hour during the production year.

Dependable conveyor drives are important to *profitable* sand and gravel plant operation. Drives are subjected to high torque starting loads, heavy peak operating pressures, and tough, continuous operation. This is the kind of service for which LINE-O-POWER products are designed. That's why you see so many of them in every type and size plant.

There's a Foote Bros. unit available to meet your drive requirements. Your Authorized Foote Bros. Distributor is as close as your telephone. Ask him to recommend the right unit for your requirements.

* *Including: 276 ft. long x 36" wide Fixed Stacker Conveyor from the Primary Crusher to the surge pile; 209 ft. x 30" wide conveyor to the Secondary Crusher; 311 ft. long x 30" conveyor to the Screening and Washing Plant.*

LINE-O-POWER PRODUCTS . . . A type and size for every need



STRAIGHT LINE REDUCER | INTEGRAL GEARMOTOR | BASE-MOUNT | LINE-O-MOTOR

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Better Power Transmission Through Better Gears

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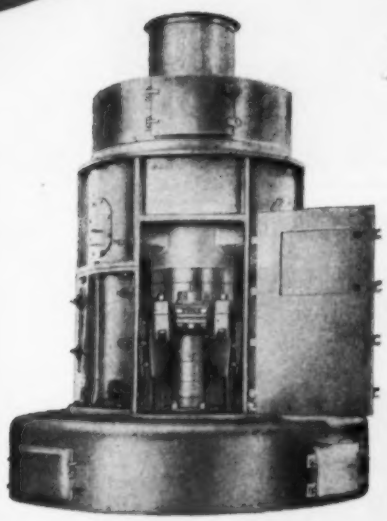
WHERE UNIFORM FINENESS IS DESIRED...
WHERE MINIMUM MAINTENANCE IS REQUIRED

The Bradley Pneumatic Hercules Mill provides uniform grinding of limestone, phosphate rock, etc. from 20 to 325 mesh. Its durable, non-clogging vibratory feeder practically eliminates manual feeding . . . allows continuous operation of the mill at its maximum capacity. And because the Bradley Pneumatic Mill is installed on a foundation flush with the floor line, it not only reduces foundation costs but simplifies inspection and maintenance. All grinding parts are also easy accessible . . . and both grinding die ring and roll assemblies can be removed without dismantling the mill. Add rugged construction to this, and you have a mill where dependable, uniform grinding is combined with an absolute minimum of replacements and downtime.

See Chemical Engineering Catalog or for complete information, write for Catalog No. 63



BRADLEY PNEUMATIC HERCULES MILLS

BRADLEY PULVERIZER CO.
superior grinding equipment since 1891

LONDON **ALLENTOWN, PA.** BOSTON

VERSATILE
SIMPLE
AUTOMATIC

DRY SOLIDS CONVEYING

Cement	Petroleum Coke	Dolomite
Carbon Black	Pulverized Coal	Pharmaceuticals
Fertilizers	Fly Ash	Sand
Hydrated Lime	Fullers Earth	Fire Clay
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Powdered and Granular Dry Chemicals

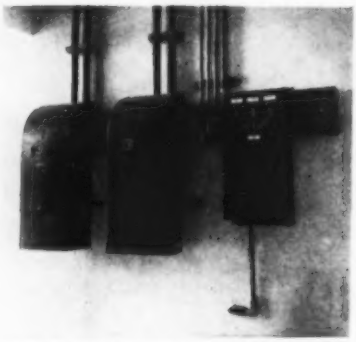
Dry cement arrives at the plant by truck in KENNEDY Air Activated Containers. It is transferred directly by air pressure to this storage silo at 10 tons per hour through a 2½" pipe.

THE KENNEDY PNEUMATIC CONVEYING SYSTEM HANDLES THESE AND MANY OTHER PRODUCTS WITH *EASE* AND *ECONOMY*

Eternit Colombiana S. A. looked for simplicity plus completely automatic operation for the dry cement handling system of their new asbestos-cement pipe and sheet plant at Bogota, Colombia.

The KENNEDY Pneumatic Conveying System met—*and exceeded*—every exacting requirement.

A KENNEDY Pneumatic Pump is located immediately below the main silo. Batch transfer to intermediate bins is accomplished without screws or other rotating parts. Batch sequence is entirely automatic.



A low level control transmits a signal to this center as the level drops in any of three intermediate bins. All controls for the complete system are in the small right hand box; the two starters are for air compressors.

When actuated by the control center, this 3-way distribution valve opens the 2½" pipeline to the proper bin; the Pneumatic Pump then transfers a 1,000 pound batch of cement from the main silo.

Below each of the intermediate bins is a mixing station which correctly proportions the ingredients for the exact product composition desired. From delivery to finished mix—every operation is simply, automatically controlled.

This simplicity, versatility and dependability is characteristic of the KENNEDY Pneumatic Conveying System. Low maintenance is assured because there are no motors, screws or other major wearing parts exposed to the moving material.

Investigate this proven system for your materials handling problems.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

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PRIMARY & SECONDARY GYRATORY CRUSHERS • JAW CRUSHERS • ROLL CRUSHERS • IMPACT BREAKERS • HAMMER MILLS • ROD AND BALL MILLS • KILNS • DRYERS • SCREENS • MECHANICAL & PNEUMATIC CONVEYORS • COMPLETE CRUSHING, LIME, CEMENT & CARBON PASTE PLANTS • KENNEDY RESEARCH AND TESTING SERVICE

BUELL PUTS "DOUBLE EDDY" TO WORK TO INCREASE DUST COLLECTION EFFICIENCY!

Ordinary cyclones provide limited efficiency in recovering cement dust from flue gases, because of "double eddy" currents inside all cyclones. But Buell Cyclones make the Double Eddy work to increase efficiency.—The Double Eddy circulates vertically inside cyclones, acting against the normal separating force of the spinning stream of dust and gas. Buell Cyclones have a narrow "Shave-off" port (2) at the top of the casing. This port catches and removes dust trapped in the Double Eddy. It makes the cyclone more efficient instead of less.—This is one of the reasons eight out of ten Buell installations pay for themselves in five years or less.—Only Buell Cyclones combine this extra efficiency with large diameter. They will not clog or plug even with dust loadings up to one pound per cubic foot of gas. No field fitting is needed: They are completely assembled and match-marked before shipment. They can be completely lined, inside and out, against heat, corrosion and abrasion.—For a list of installations near you, a copy of our Catalog 103, or other information, call our nearest representative, listed in the telephone classified directories of most major cities under "Dust Collection Systems". Or write Dept. 18-J, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y. (Subsidiary: Ambuco Limited, London, England.)

1. Inlet for dust-laden flue gas.
2. Dust Shave-off port.
3. By-pass dust channel.
4. By-pass re-entry opening.
5. Dust outlet.
6. Clean flue gas outlet.

EXPERTS AT DELIVERING EXTRA EFFICIENCY IN DUST RECOVERY SYSTEMS • Cyclones • "SF" Electric Precipitators • Combination Systems • Dry Classification Systems

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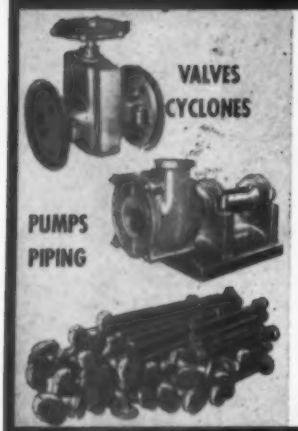
LINATEX
LASTS LONGEST



Line WITH LINATEX
(a specially processed rubber)
the most effective way to combat abrasion
CHUTES — LAUNDERS
HOPPERS — SKIPS
TABLE DECKS
CONVEYOR BELTS
Write for free information

LINATEX CORP. OF AMERICA
P.O. DRAWER "D". STAFFORD SPRINGS, CONN.

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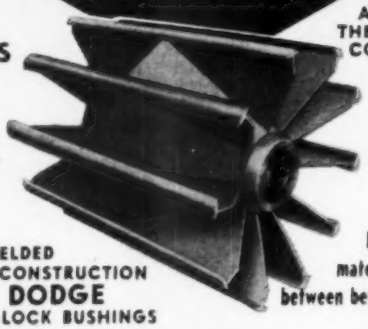
CUT OPERATION COSTS with VAN GORP Turn-Clean PULLEYS

SIZES 8" to 60"



ADDS TO THE LIFE OF CONVEYOR AND ELEVATOR BELTS
√
Self-Cleaning Cone Design
√
Prevents any material build-up between belt and pulley

ALL WELDED STEEL CONSTRUCTION WITH DODGE TAPER-LOCK BUSHINGS

CATALOG OF OVER 3,000 SIZES ON REQUEST

Van Gorp Mfg. Inc.
PELLA, IOWA

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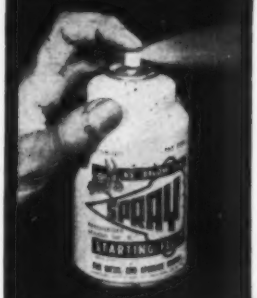
DREDGE SLEEVE CLAMPS
Sturdy • Practical • Dependable • Economical

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U.S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply... positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC.
9th Ave. at 4th, Mendota, Illinois

Enter 186-B on card, page 155



START ENGINES EVERY DAY WITH SPRAY...

STARTING FLUID FOR DIESEL & GASOLINE ENGINES

Get more starts, quicker starts, at lower cost with SPRAY STARTING FLUID. Both the fluid and propellent burn . . . there's no waste! Each pressurized can contains enough fluid for many starts . . . starts that will sustain combustion until a smooth running engine can take over. Our greater supply of "vapor pressure" at all temperatures, atomized at a high initial rate, shortens cranking and warm up time, reduces dilution, prevents electrical and starting system wear, saves wasted man hours and equipment down-time. SPRAY is atomized for safe application and quantity control . . . use only as much as the engine requires. Field-proven SPRAY STARTING FLUID will start the toughest engine down to 65° below zero . . . but for year 'round economy start engines every day with SPRAY! Sold through automotive jobbers everywhere.

Ask about INSTNSTART closed system starting.

Insist on the can with the "balky donkey" trademark.

SPRAY PRODUCTS CORPORATION
P. O. Box 844 • Camden 1, New Jersey

Enter 186-D on card, page 155

Enter 187 on card, page 155 →

Need grinding balls in a hurry?

CONTACT UNITED STATES STEEL! If all of a sudden you find you're caught short on grinding balls, you can get them fast from United States Steel. For example, a company in West Virginia needed 40,000 pounds of 1½-inch diameter grinding balls in a hurry. They requested delivery "as soon as possible." The order was entered by our Baltimore Sales Office and *shipped the following day*.

Though most companies place orders for grinding balls two to three months in advance, there are always emergencies . . . and United States Steel is ready to help you out when that emergency comes up. A complete stock of USS Carbon-Manganese Steel and USS Alloy Steel Grinding Balls is maintained at all times.

We can ship grinding balls almost any way you like: In 100-pound capacity burlap bags; in 2,000-pound capacity steel drums; in semi-trailer or dump trucks; in gondola or box cars (loose or in containers); or you can send your own truck if you like. The next time you need grinding balls contact the United States Steel Sales Office nearest you, or write or call United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

USS

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

United States Steel

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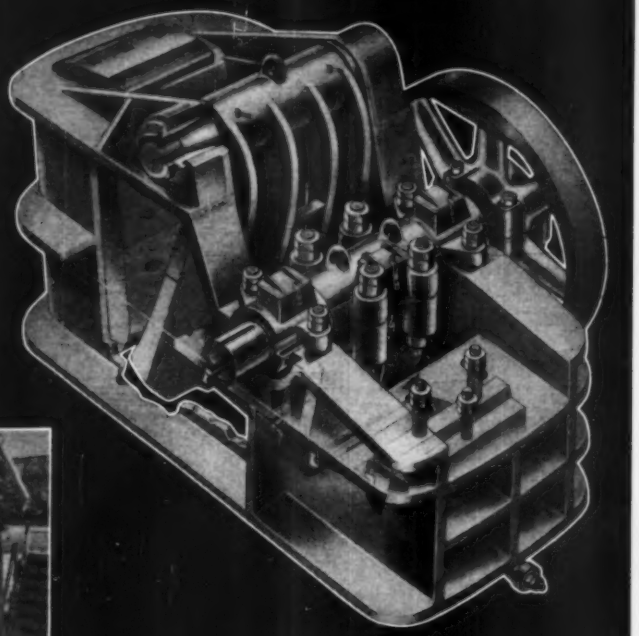
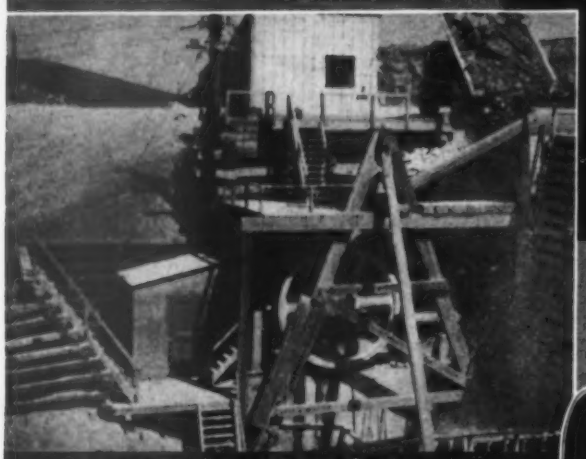
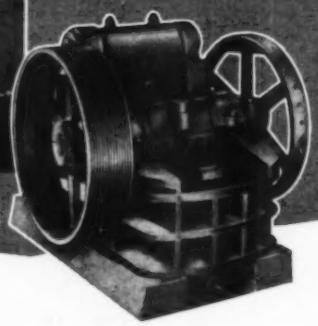
Traylor-made H & HB Jaw Crushers

Cutaway view below shows the advanced design of Traylor type HB Jaw Crusher.





56" x 72" Type HB Jaw Crusher installed in quarry of a steel mill.



See the Traylor Display
at the CHEM SHOW, Booth No. 495
New York Coliseum, Nov. 30—Dec. 4

One of the many important features of the Traylor HB Jaw Crusher is the Traylor developed curved jaw plates employing the principal of the famous curved setting which have proved so successful in Traylor crushing machinery. The forged steel swing jaw shaft and the patented swing shaft suspension are two more of the features built into Traylor Jaw Crushers. For more information, write for Traylor Bulletin No. 5105.

GYRATORY CRUSHERS • JAW CRUSHERS
Traylor
ROTARY KILNS • BALL MILLS • APRON FEEDERS

TRAYLOR ENGINEERING & MFG. CO. 1205 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco
Canadian Mfrs. Canadian Vickers, Ltd., Montreal, P.Q.

TROJAN GETS ITS SEA LEGS

...outclasses all other tractor shovels for principal job of barge unloading at concrete pipe plant...

"We tried out six loaders before we bought our Trojan," says Ralph M. Simpson, plant superintendent, Seattle Concrete Pipe Company in Seattle, Washington.

REPLACES TWO MACHINES

After landing the job of "handy-man", the Trojan went on to prove it could easily take the place of a crane and truck in the unloading of barges and distribution of material – and do it more efficiently, more economically. Its fast cycle operation proved invaluable as this major change was made in the handling of incoming materials.

ANOTHER PAT-ON-THE-BACK FOR TROJAN

Mr. Simpson goes on to say, "Not only does the Trojan serve us well in its primary job of barge work, it moves material all over the yard, cleans up, moves other equipment and even levels ground. We tried them all and judged the Trojan best for the job."

BEST BY TEST

This is one more example of Trojan's ability to outwork other machines. Ask your distributor . . . he'll be glad to demonstrate its outstanding versatility on *your* job.

Here, on board the barge, the hard-working Trojan picks up another load of gravel for transportation to the stockpile area.

AD NO. 44-40

The Trojan line includes eight models with lifting capacities from 5,000 to 20,000 lbs. and bucket capacities from 1 to 4 cu. yds.

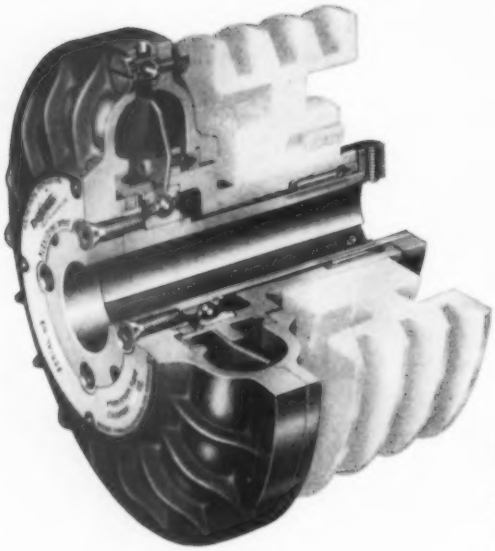
THE YALE & TOWNE MFG. CO.
TROJAN DIVISION

BATAVIA, NEW YORK • SAN LEANDRO, CALIFORNIA

TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

WHAT'S YOUR PROBLEM?...

- ☑ Overheated motors?
- ☑ Excessive belt maintenance?
- ☑ Breakage of materials being processed —like thread, wire, paper?
- ☑ Expense of oversize or high torque motors?
- ☑ High demand rate?
- ☑ Expense of reduced voltage starters?
- ☑ Clutch trouble?
- ☑ Breakage of transmission parts due to instantaneous shock loads?
- ☑ Damage and recurring down-time from overloads?



FLEXIDYNE

THE DRY FLUID DRIVE

It is no longer necessary to accept the destructiveness—the costliness—of conventional starting in the mechanical transmission of power. Flexidyne changes that!

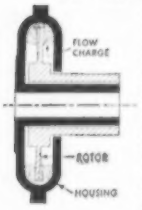
Flexidyne is the new way to start loads *smoothly*—to protect against shock and overload—to save power—all *without any sacrifice of efficiency at full load!*

This revolutionary development is ushering in "the day of the soft start"—which can mean thousands of dollars to you in equipment savings and in better, more economical operation.

Flexidyne is available, off the shelf, in Drives and Couplings. Capacities range from fractional to 1,000 hp. Ask your local Dodge Distributor or write us for technical bulletin.

DODGE MANUFACTURING CORPORATION, 4000 Union St., Mishawaka, Ind.

HOW FLEXIDYNE WORKS



The "dry fluid" in Flexidyne is tiny heat-treated steel shot. A measured amount, called the "flow charge," is contained in the housing, which is keyed to the motor shaft. Inside the housing is a rotor, free to revolve relative to the housing, but connected to the load.

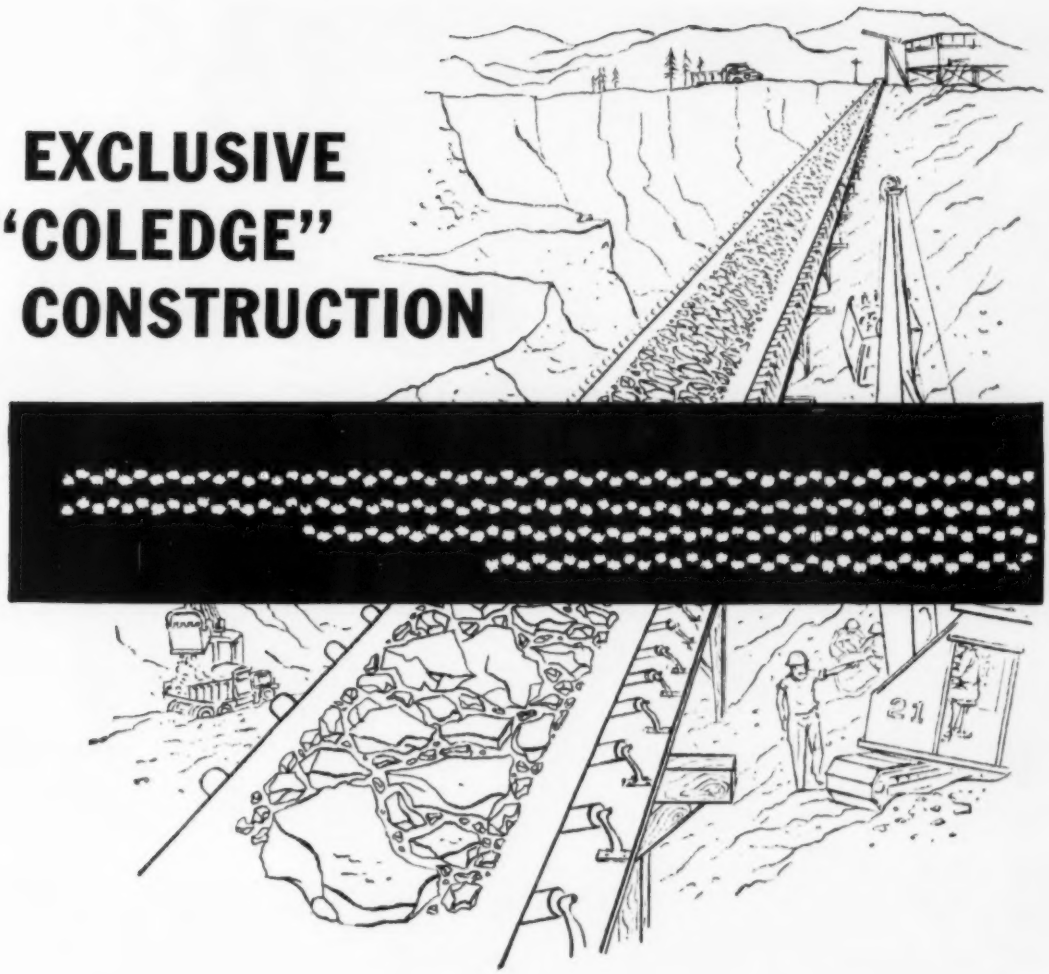
When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, packing it between the housing and the rotor, which transmits power to the load. Initial slippage is momentary. Housing and rotor become locked together and achieve full load speed without slip and at 100% efficiency.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE

of Mishawaka, Ind.

EXCLUSIVE "COLEDGE" CONSTRUCTION



Quaker Thermoid gives Thermoid Conveyor Belting extra life where it counts

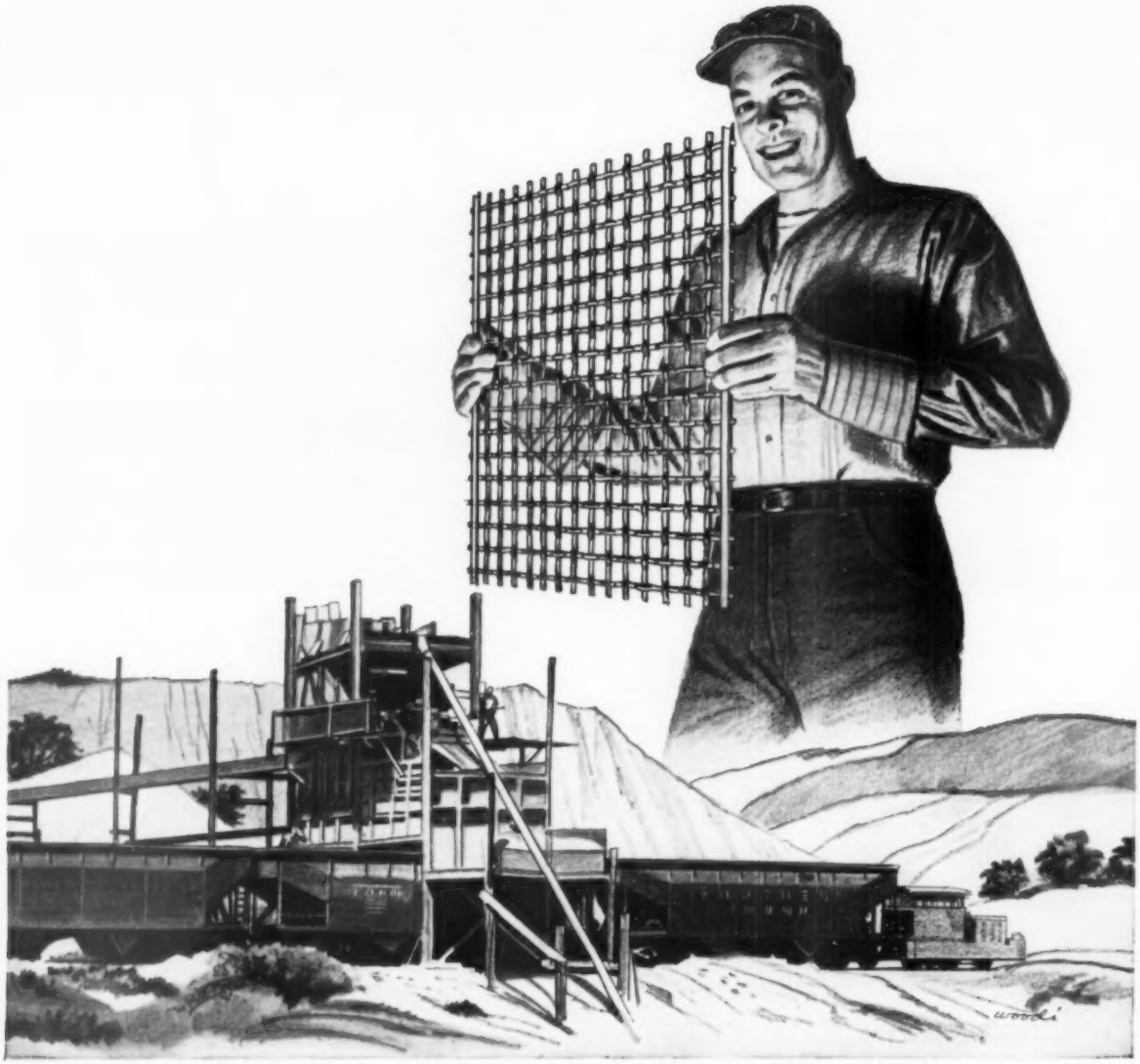
Punishment at the edges—especially the tough use dealt out in quarrying—can kill most conveyor belting in a fraction of the time that Thermoid-Quaker Conveyor Belting lasts. The unique "COLEDGE", though, available on all grades of Thermoid-Quaker Conveyor Belting, puts more rubber where it's needed, makes a more flexible and wear-resistant edge where the abrasion is greatest. Tests show Thermoid-Quaker Belting with "COLEDGE" construction lasts and lasts on the same jobs where other belting fails.

What's more, all Thermoid-Quaker Conveyor Belting is *prestressed* in manufacture, so that the belt is actually in compression when you get it—ready for the heaviest load without strain.

Examine Thermoid-Quaker Conveyor Belting with the exclusive "COLEDGE" construction at your Thermoid distributor's, or write for further information to *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Philadelphia 24, Pa.*

THERMOID DIVISION PORTER H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD



CF&I Space Screens

reduce cost by cutting downtime

This Image—the CF&I giant steelman—reflects CF&I's experience and versatility as a *primary producer* of quality steels and hundreds of steel products for industrial use. And the CF&I Image is your assurance of durable, accurate space screens.

Because CF&I Space Screens are designed to give long service life, you have fewer work stoppages due to screen failures, and your cost-per-ton screened is reduced. The types of wire, weave, crimp and edge preparation are chosen to give maximum performance under specific job conditions. Included in the types of screens available are Super Tempered Screens, made from a special oil-quenched wire, and Wisscoloy Screens, made from a special alloy steel wire. The wire in each screen is crimped to close tolerances for accurate spacing, and woven extra tightly on heavy-duty hydraulic looms so that spacing remains uniform during use.

For engineering assistance and prompt, dependable service, call the CF&I sales office nearest you.

CF&I SPACE SCREENS

THE COLORADO FUEL AND IRON CORPORATION

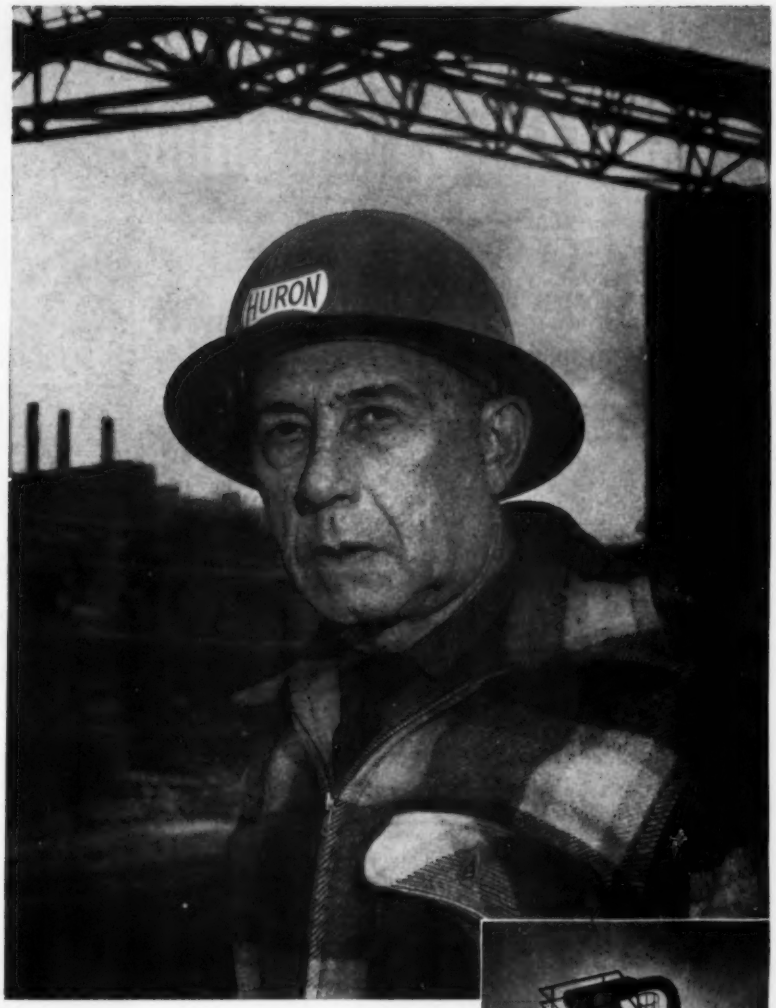
CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg 6623-A



Mr. Clarence Shea,
Dust Control Supervisor at
Huron Portland Cement Company's
Alpena (Mich.) Mill
reports:

"Huron chose Dracco for rugged-duty dust control"

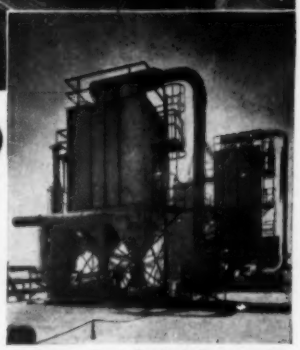
"Our Dracco System," says supervisor Shea, "works 'round the clock, recovering 8 tons of dust a day from finished product handling operations. This saves enough to pay for the collectors in a year and a half. And it eliminates the possibility of the dust becoming a community nuisance."

"No manpower is needed to operate the system. Fiker bag cleaning is automatic, takes only 2½ minutes per compartment. Dracco equipment has proven reliable and efficient when shaking time is concerned."

"The collectors were easy to install despite their roof location. Because they were engineered for long life and efficient dust removal, we expect that they will be functioning long after more fragile machines have been replaced."

Controlling cement dust is one of the toughest jobs you can give a dust collector. But Dracco Dust Control Systems are built to take the beating of 24-hour-a-day duty, abrasive dusts, heavy dust loads.

If your tough dust problem is still unsolved, why not let Dracco take over? You'll get a low-cost, permanent solution.



Dracco Dust Control System at Huron Portland Cement provides continuous recovery of fine dust from alleviator used to reduce pressure at end of air conduit carrying finished cement to storage.

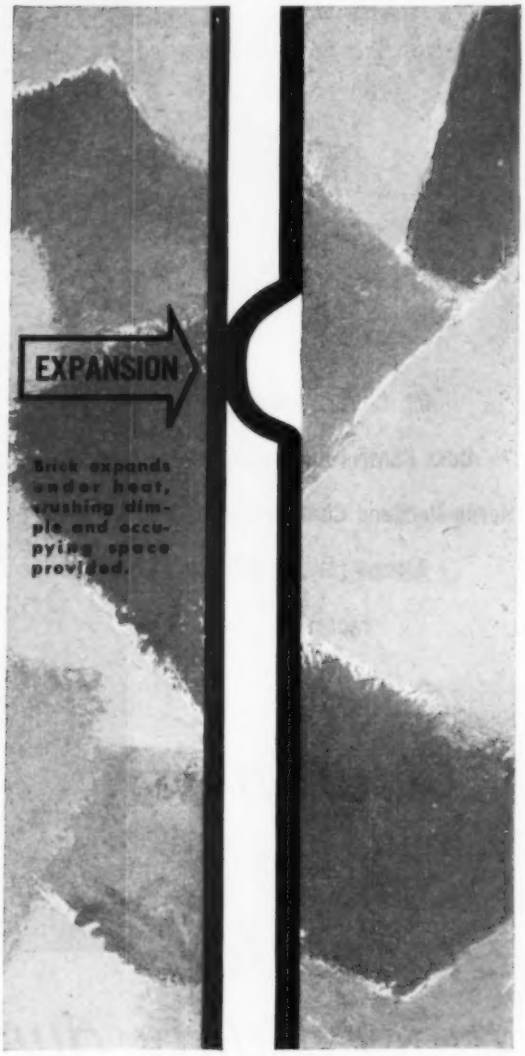
DRACCO DIVISION OF FULLER CO.
4050 East 116th Street · Cleveland 5, Ohio

DRACCO (Pronounced Dray'co)
airstream conveyors
dust control equipment

Porter Kilmag Brick

FOR ROTARY KILN LININGS:

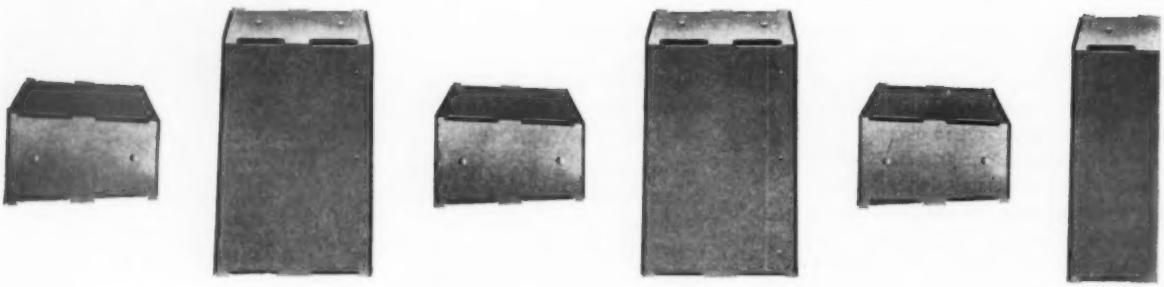
requires no "paper work"... dimpled steel spacers set up perfect expansion allowance



Porter Kilmag is a burned, magnesite-chrome brick with patented* "dimple" cladding . . . *an exclusive Porter feature!* Because of Kilmag's dimple cladding, you get these important mechanical advantages: (1) Kilmag requires no added labor, "paper shimming" or other field expedients to establish proper expansion. (2) Kilmag lays up faster. (3) Kilmag reduces labor costs. (4) Kilmag's expansion dimple is permanent *regardless* of storage conditions.

Kilmag's refractory qualities match its mechanical excellence. A dense, thoroughly burned structure provides uniform strength from cold to hot face, under stress. Kilmag has an exceptional ability to build and *hold* a clinker coating. Kilmag brick are available in 6" arches and 9" wedges. One shape turns a given diameter, plus a 2½ and a 3¼ brick for keying up.

For complete details on cost-saving, high efficiency Porter Kilmag, or *any* refractory application, write: *Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.* *Pat. Pending



REFRACTORIES DIVISION **PORTER** **H.K. PORTER COMPANY, INC.**

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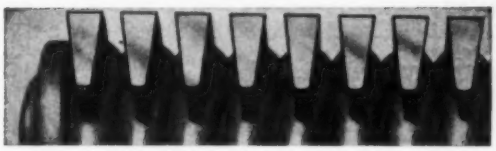
HOW TO SELECT DEWATERING SCREENS THAT FIT YOUR REQUIREMENTS EXACTLY

How to select Perforated Plate

Let Hendrick suggest the analysis of H Quality Steel that will stand up longest under your operating conditions. Eliminate blinding with a Hendrick screen that provides full clearance. Get continued product uniformity from the accurate, uniform mesh of a Hendrick screen.

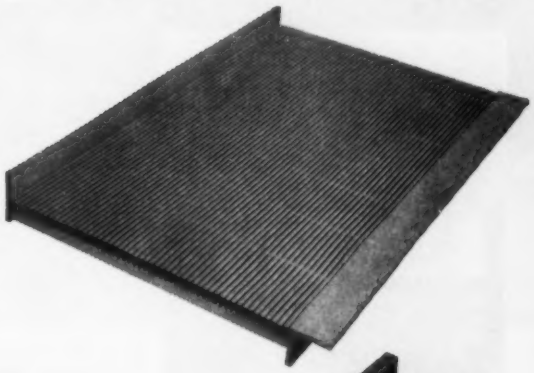
How to select Wedge Wire

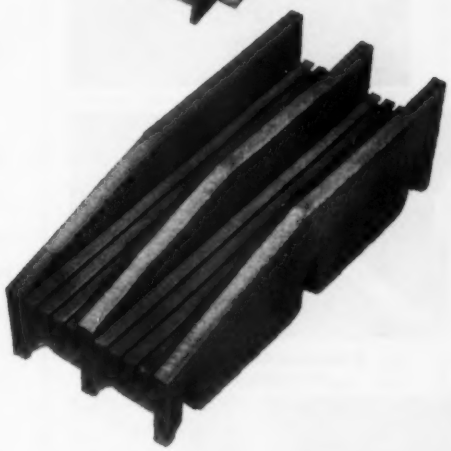


Here are three things to look for: 1) Free clearance—to reduce chances of clogging and blinding. 2) A tapered profile bar, for dewatering efficiency. 3) A deep profile bar, to assure long service life and maximum load-carrying capacity. Get all of these in Hendrick Wedge Wire. There is a type to suit your operating conditions and your needs—whether you want good screening efficiency, good dewatering efficiency, or high resistance to abrasion.

How to select Wedge Slot Screens

For more efficient processing, look for accurately spaced, uninterrupted slots. For heavy-duty service, look for thick, parallel head flanges that maintain uniformity of openings. To prevent abrasion by large chunks, specify Skid Bars. Hendrick offers all of these—*plus* 8 different profile bars. Hendrick will gladly help you select the type that will stand up best under your operating conditions.





Hendrick

MANUFACTURING COMPANY

Headquarters for All Your Screening Needs

39 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring – Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Hendrick Manufacturing Co.
39 Dundaff Street, Carbondale, Pa.

Please send me your catalog on:

- ☐ H Quality Steel Perforated Plate
- ☐ Wedge Slot Screens
- ☐ Wedge Wire

☐ I would appreciate a call from a Hendrick Sales Engineer.

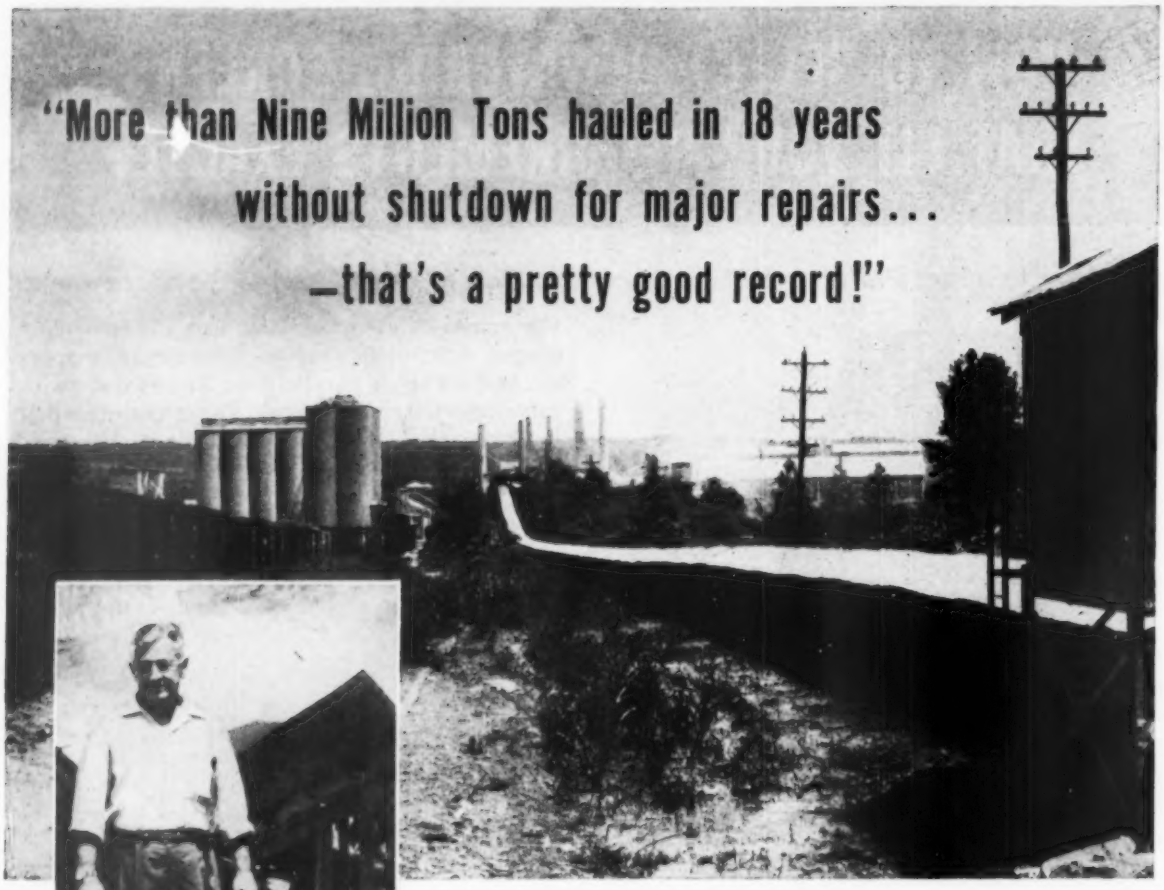
Name_____

Company_____

Address_____

City_____ Zone_____ State_____

"More than Nine Million Tons hauled in 18 years without shutdown for major repairs... —that's a pretty good record!"

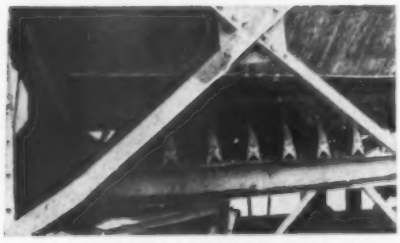


—says M. K. LaRue

Chief Engineer,
NATIONAL CEMENT COMPANY, Ragland, Alabama

"When Continental installed this 24-inch belt conveyor line in 1941, it was designed to haul 196 TPH. As plant capacity increased, the load went up correspondingly. Today its normal operation is at 155% of rated capacity, and on test it has operated satisfactorily at 192%. It is estimated that in its 18-year lifetime, it has hauled more than 9,000,000 tons of crushed cement rock and shale, and has never been shut down for major repairs."

To which we can only say, *"Thank you, Mr. LaRue!"*



Continental Belt Feeder under secondary crusher.

In its 1¼-mile run, this unique conveyor carries 304 TPH over rolling terrain (and under a highway) at very low cost.

For all your material handling needs . . . . . See your Authorized Continental Distributor

CGC

INDUSTRIAL DIVISION

Continental Gin Company

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • HOUSTON • HUNTINGTON • MEMPHIS • MOBILE • NEW YORK 17

"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.

Sturtevant Air Separators classify production loads up to 150 tph by exact control of air currents and centrifugal force. Simple, quick adjustments make possible the selection (or rejection) of particles in the 30 to 400 mesh range. Nine standard models available, varying in size from 3' to 18'.

Learn how a Sturtevant Air Separator can help your aggregates production. Write today describing your needs. Address: Sturtevant Mill Co., 104 Clayton St., Boston 22, Mass.

STURTEVANT AIR SEPARATORS CLASSIFY SAND WITHOUT WATER

PRODUCING CLEAN SAND, the Sturtevant acts as a de-duster by removing fine mesh particles from the throughput. Particularly valuable where water is limited.

EASING SCREEN LOADS, the Sturtevant rejects unwanted fines and circuits coarser sizes to screens for grading. By this pre-classification, the possibility of blinding screens with fines is minimized and output considerably increased. Also, excessive dust problems are eliminated.

WHEN BLENDING IS NECESSARY, the Sturtevant selects fines from the crushing operation. This stockpiled product then can be used in the blending operation to overcome fineness modulus deficiencies.

GRINDERS
CRUSHERS
PULVERIZERS
MICRON-GRINDERS

STURTEVANT MILL CO.

Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

MIXERS
BLENDERS
ELEVATORS
AIR SEPARATORS

Four reasons why this NI-HARD cast drop ball is a smash hit!

This Ni-Hard* cast iron drop ball is dedicated to a long life "on the rocks." Its service record – and that of other GIW Ni-Hard drop balls produced by the Special Products Division of Georgia Iron Works, Augusta, Ga. – has proved to be *four* times longer than that of any other type ball. In fact, most GIW Ni-Hard balls have replaced forged steel balls. Here are four reasons why:

• **Design.** Notice the design of the ball. It has been quoted to be so well balanced that the operator is able to lift and drop the ball more times per shift. One operator stated that his overtime was eliminated when he started using Ni-Hard balls.

• **Abrasion resistance.** Ni-Hard is one of the hardest commercial products of the iron foundry, possessing outstanding abrasion resistance. This important property enables Ni-Hard balls to withstand the severest wear of the hardest rocks.

• **Strength and toughness.** In addition to abrasion resistance Ni-Hard drop balls are tough enough and strong enough to withstand impact in this most demanding operation. They resist breaking or chipping.

• **Economy.** Only a Ni-Hard *cast* drop ball could be economically produced to take advantage of the money-saving features mentioned above. And, of course, the long service life of Ni-Hard drop balls means greater operating economy.

Put these Ni-Hard advantages to work for you. Next time you buy drop balls, get in touch with a Ni-Hard producer. There's one near you. If you don't have his name, write Inco for a list of authorized Ni-Hard producers.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

NI-HARD

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

New
CYCLO-TRELL
MECHANICAL
DUST COLLECTORS

These new Cyclo-trells can be built to fit any specific job. Available in Types C-10 (10″ diameter), C-24 (24″ diameter), IC (involute Cyclo-trell), ICL (involute Cyclo-trell, lined) and C-24-L (24″ lined). Also available: a new hopper discharge valve.

Write now for your copy of new Bulletin 300 which gives details and illustrations of the new Cyclo-trells and hopper discharge valve.

Research-Cottrell, Inc.

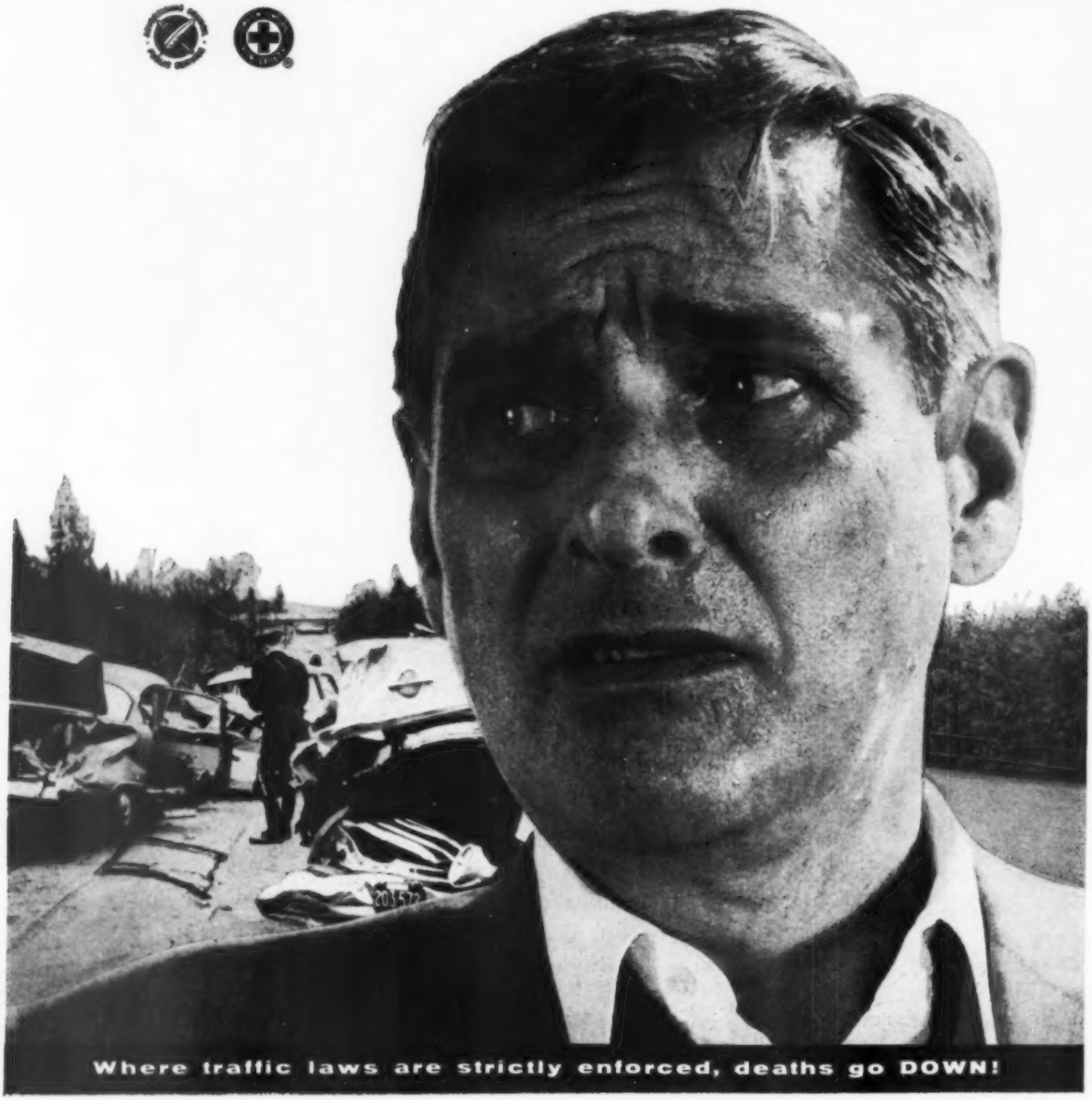
RESEARCH COTTRELL INC. TRADEMARK RC203

Main Office and Plant: Bound Brook, New Jersey

REPRESENTATIVES IN PRINCIPAL CITIES OF U. S. AND CANADA

"I wish I could have done something to help . . ."

You can do something about traffic accidents! Drive safely yourself—obey the law. Sure. But you can do a lot *more!* Traffic accidents affect *everybody.* Reducing them is a community problem. Its solution calls for systematic, organized effort and cooperation with public officials—for teamwork and leadership. Here is where *you* can help. Join with others who are working actively to promote safe driving and secure strict enforcement of all traffic laws. Make your influence count. *Support your local Safety Council!*



Where traffic laws are strictly enforced, deaths go DOWN!

Published in an effort to save lives, in cooperation with the National Safety Council and The Advertising Council.

The Standard of Comparison for FINE GRAIN STRUCTURE

You can see, even without magnification, the finer, denser grain structure of Sheffield Moly-Cop balls. The uniformity, hardness and toughness of this grain structure extend to the very core of the ball. It's the standard of comparison in grinding ball performance tests. And a big reason why you'll get longer service, less down-time, and other important production economies with Sheffield Moly-Cop Grinding Balls.

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YOU CAN'T BARGAIN WITH SAFETY

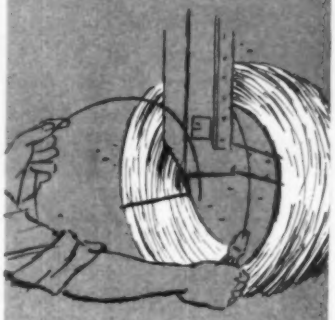
Wire Ropes may look alike...
but it's performance that counts

The Image of CF&I stands for the top performance records of all CF&I steel products. For instance, take one of these products—CF&I-Wickwire Rope.

Many brands of rope *look* alike but the rope you buy must pay off in *performance*, not *appearance*. With Wickwire Rope you get a number of quality factors that lead to outstanding performance. These factors are "built-in" the rope through many quality controls and tests. Since CF&I performs all steel producing, wire making and rope fabricating operations within its own plants, exacting control and testing procedures can be carried out and supervised at every step. Here is just one of these procedures:

Both-Ends Physical Tests
Samples are cut from both ends of every coil of wire and given complete physical tests — for tensile strength, roundness, torsion and uniformity of diameter. Coils that fail any test are rejected for such critical applications as wire rope.

We have recently printed several folders that discuss many more Wickwire control and testing procedures, plus wire rope recommendations for specific equipment. To get a copy, contact the nearest CF&I sales office—but please *state your industry or type of equipment.*



Both-ends testing of wire ensures safety and top performance in CF&I-Wickwire Rope.

WICKWIRE ROPE
THE COLORADO FUEL AND IRON CORPORATION 6958

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FOR THE JET AGE... LONGER RUNWAYS AND VINSOL PLAYS ITS PART

Vinsol resin has long been recognized as the most economical air-entraining material.

Today, with a record billion dollars to be spent this year alone on new and enlarged military, municipal, and private airports . . . with highway construction proceeding at an accelerated pace . . . with new construction of office buildings changing the skyline of our major cities—the efficiency and economy of Vinsol as an air-entraining agent for concrete is more important than ever.

Since the concept of air-entraining was first introduced by the cement industry in the 1930's, Vinsol has been widely specified for use in this field. Write to Hercules for technical data explaining the many advantages of Vinsol.

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the right approach to any digging problem

HENDRIX
DRAGLINE BUCKETS

even in wet digging..

Hendrix Dragline Buckets produce MAXIMUM loads for GREATER PROFITS! The scientifically-arranged perforations let water go through . . . leaving more material *inside!*

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

"In plant" service records prove

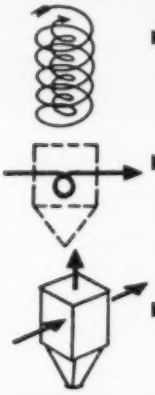
For Centrifugal Collection of Kiln Dust...

NOTHING EQUALS THE 24 IH MULTICLONE

That's a big statement—

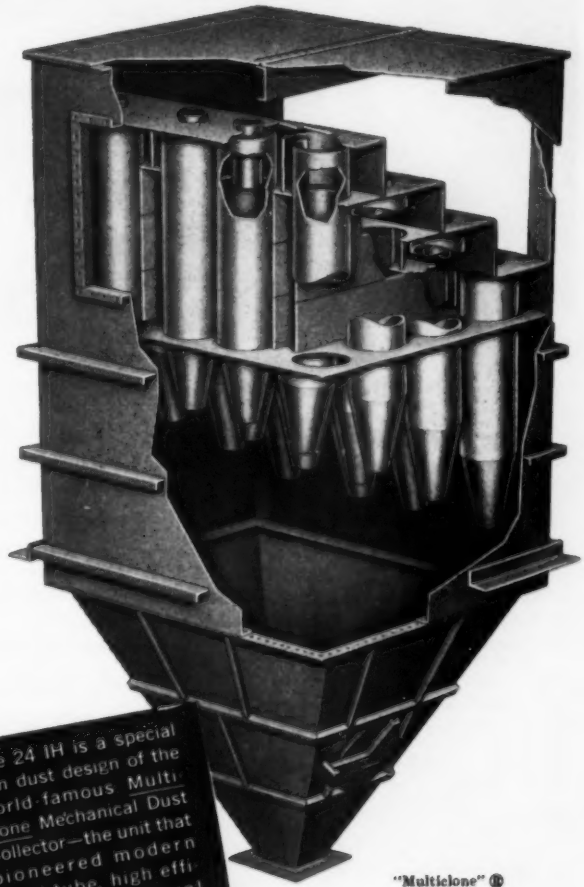
but the proof behind it is even more impressive

The 24 IH has over 7 years of actual plant service behind it—not just one or two installations, but in a wide range of cement plants in all parts of North America with many types of kiln dust collection problems. In one application after another the 24 IH Multiclone Collector has proven to be:



- the most efficient of any mechanical equipment for kiln dust collection because of its high speed centrifugal cleaning action!
- the most trouble-free of any unit, because its straight "in line" flow design and large diameter tubes prevent clogging and costly down time for servicing!
- the easiest to install because its simple cubic design fits new or existing plant layouts!

In addition, convenient rodding holes can be installed in cover and inlet panel to simplify tube cleaning while the unit is in service...and where high sulfate conditions exist, removable outlet tubes can be supplied to cut maintenance costs.



"Multiclone" ®

The 24 IH is a special kiln dust design of the world-famous Multiclone Mechanical Dust Collector—the unit that pioneered modern multi-tube, high efficiency dust collection!

The 24 IH MULTICLONE will give you completely new standards of performance—higher efficiency, lower maintenance, longer life, and maximum adaptability to *your particular* operating requirements!

Our representatives will gladly supply complete details. Or write direct.

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Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

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1. Rugged construction and slow speed insure utmost dependability and minimum maintenance.
2. Whizzer separator gives a wide range of fineness with finger-tip control.
3. Automatic feed control assures maximum capacity — with only part of one man's time required for the mill operation.
4. Combined operations of pulverizing, classifying and conveying offer economies and simplification in plant design.
5. Flexibility of layout.
6. Dust-free operation.

For further details, write for the Raymond Roller Mill Catalog #79.

THIS huge 66″ Raymond Roller Mill is the *heart* of the modern equipped plant of the Federal Foundry Supply Division of Archer-Daniels-Midland Company at Colony, Wyoming.

The raw bentonite is first reduced in a slicer ahead of an 8′ diameter by 60′ long rotary dryer where the moisture is reduced from 30% down to 8%-10%.

The Raymond Roller Mill then pulverizes, classifies and conveys the finished material to storage silos, where the product can go to bag packers or bulk loaders.

This Super Roller Mill has a rated capacity of 500 tons per day at a fineness of 90% minus 200 mesh. It can produce various grades, with classification easily controlled over a wide range.

Archer-Daniels-Midland Company has incorporated automatic control features in the system to permit operation of the entire plant by two men on a shift.

COMBUSTION ENGINEERING, INC.
Raymond Division
1122 W. Blackhawk Street
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Combustion Engineering-Superheater Ltd., Montreal, Canada

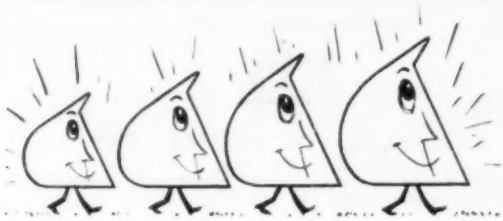
When is a 2-yd Loader *Not a 2-yd Loader?*

. . . Simply when it operates over or under carrying capacity. The right combination to peak production and longer loader life is the right size bucket on the right size loader.

That's why Allis-Chalmers offers a wide selection of buckets for each of the TL-14, TL-16 and TL-20 TRACTOLOADERS. You choose the size that's just right for the weight of materials you handle and your job operating conditions.

Some buckets are too big . . . others too small

Using a bucket that's too big for the material you handle can cause excessive repairs and downtime . . . using one that's too small costs you money because you're not getting all you can out of your loader. That's why you should select your bucket/loader by carry capacity. For example, with the TL-20 which has a 9,000-lb carry capacity, you could use a 3-yd bucket in materials that weigh 3,000 lb. You could use a 5-yd bucket with materials that weigh 1,800 lb.



Fit the bucket to the job

Whether you're working good, level terrain, swampy ground or hilly country, there's a right loader and bucket combination for your material needs . . . your operating conditions. Choose from 17 bucket/loader combinations.

BOTH *loader and bucket* have to be tough

. . . or the most efficient selecting in the world won't help! That's why Allis-Chalmers offers such outstanding features as extra-high spill guards . . . double-bottom bucket and replaceable wear plates — why TRACTOLOADER axles are pin-connected directly to the frame with 2-inch-diameter steel pins instead of the usual U-bolt method. There is no rolling or shifting under load — no bolts to work loose, no mounting plates to warp out of shape.

Your Allis-Chalmers construction machinery dealer can assure you longer loader life . . . more consistent production year after year than anyone else. His products are by-products of experience — backed by first-line quality parts and good service.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

TL-14 — 6 buckets
from 1 to 3 cu yd • 86 hp gasoline
83 hp diesel • 14,850 lb

TL-16 — 5 buckets
from 1½ to 4 cu yd • 109 hp gasoline
104 hp diesel • 18,000 lb

TL-20 — 6 buckets
from 2¼ to 5 cu yd
130 hp diesel • 23,250 lb

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INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP TO 50% with

ROLLING OUTRIGGERS
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that FIT ALL MAKES AND MODELS OF TRUCK CRANES

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- RUGGED CONSTRUCTION
- INSTALLED IN FIVE QUICK MINUTES

One Pair Single Tandem Units, Weight approx. 1360 lbs.
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Manufactured by Lincoln Welding Works, Inc., 1320 So. "A" St., Las Vegas, Nevada

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Exclusive cold self-vulcanizing material

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- Applied without removing belt
- Ever-last bond won't melt, unaffected by moisture, petroleum, most acids
- Eliminates danger of heat damage to belt during repairs
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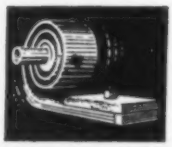

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A subscription to
Pit and Quarry

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PLATE FASTENERS FOR CONVEYOR BELTS

Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/4" thickness. *Write for Catalog Sheet.*

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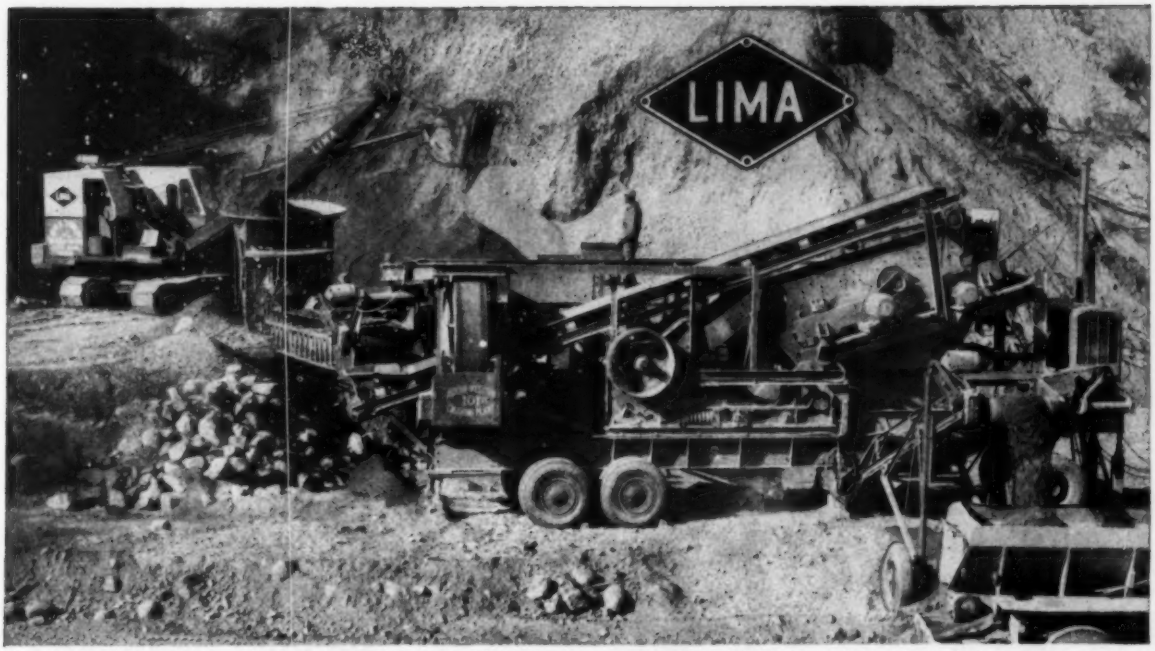


Lima Austin-Western portable 101-SE Crushing and Screening Plant processes gravel and rock fed into its mechanical feeder in 1-cu.-yd. bites by Lima Type 44 Shovel. Accurately sized gravel travels conveyor direct to waiting State Highway truck at this Buchanan, Mich., site.

Crusher output averages 1000 cu. yd. daily— Lima Austin-Western 101-SE owner pleased

Roadbuilder John G. Yerington, of Benton Harbor, Mich., owns five Lima Austin-Western Crushing and Screening Plants. Of his portable 101-SE, shown above, Mr. Yerington says, "It is about 4 years old, but maintenance costs are extremely low. I'm well pleased with its ability to average over 1000 cu. yd. daily at a low cost per ton."

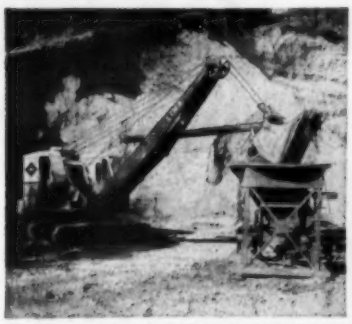
Superior performance

Thirty-one years ago, he bought his first Austin-Western equipment. Now he owns five Lima Austin-Western Crushing Plants and a Lima Type 44 Shovel. In addition, he has three graders, five rollers and a hydraulic crane—all Austin-Westerns. Obviously Mr. Yerington has learned from experience the superior capabilities of B-L-H equipment.

The rugged 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials at end-use sites reduces haulage time and costs. Diesel engine operates crushers and electric generator, which powers all other operations. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, lowers tonnage costs. Only one man is required to operate the 101-SE by push button.

More tonnage for less

Lima Austin-Western Crushing and Screening Plants are engineered and quality built to produce a high volume of accurately sized gravel or rock over long years of trouble-free service. There is a portable or stationary Lima Austin-Western Crushing and Screening Plant exactly right for your needs. Learn how you can step up production and lower tonnage costs. See your nearest distributor or write us today!



Crawler-mounted Lima Type 44 Shovel empties its 1-cu.-yd. load into automatic feeder of Lima Austin-Western 101-SE Crushing and Screening Plant.

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Quarry or gravel pit experience. Location in the Middle West.

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Mechanical or Civil

Experience Desirable

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Plant engineer is responsible for all engineering and construction work at the plant.

Multiplant Company

Located in Michigan

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Cedarapids 6C, 1236 twin jaw portable secondary.
Cedarapids 1236 twin jaw crusher.
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Cedarapids 3042 double impeller breaker. Rebuilt.
Cedarapids model 1 Kubit impact breaker.
Cedarapids 2633 hammermill. Slightly used.
Williams No. 43 Slugger Type Pulverizer.
Cedarapids 4' x 14' 2-deck screen. New warranty.
2—Cedarapids 4'x12' 3-deck screens. Rebuilt.
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27½ ton, single-compartment 8' x 12' bin.
Eagle 36"x20' double log washer. Good.
McLanahan & Stone 8"x30' double log washer.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two-compartment, 13" x 23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conv. belting.

SHOVELS AND CRANES

P&H855B-LC 2-yd. diesel dragline.
Lorain L-26, ¾-yd. diesel dragline. Excellent.
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Lorain MC-414, 20-ton Moto-Crane. Reconditioned.
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Michigan TLDT-20, 20-ton truck crane.
Lorain SP-107, 7-ton, self-propelled Crane.

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2—Euclid 13-yd. bottom dumps. Good.
2—Euclid 46TD, 22-ton rear dumps.
3—Euclid 80FD, 15-ton rear dumps.

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1—Caterpillar D-8 with push block.
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1—Caterpillar D-7 with hydraulic angledozer.
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1—International 300 with loader, backhoe.
1—Letourneau Super C Tournadozer. Excellent.

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2—Allis Chalmers TS-360, 15-yd. overhung engine scrapers.
1—Euclid TS-24, 24-yd. twin engine scraper.
1—Euclid TS-18, 18-yd. twin engine scraper.
3—Euclid 18-yd. overhung engine scrapers.
1—Euclid 15½-yd. six wheel scraper.
2—Euclid 12-yd. overhung engine scrapers.
1—Euclid 7-yd. overhung engine scraper.

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Osgood 903, 2-yd., 24' boom, 20'6" stick.
Lorain 26, ¾-yd., 19' boom, 16' stick.

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Universal 5KW, D.C., 1200 RPM, 220-250 volts.
Century-Waukesha 13 KW, 1200 RPM, 3/60/127-220.
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Cat. 7D7700, 74 H.P. at 1000 PPM. Rebuilt.
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GM 3021C, 3-cylinder, new.
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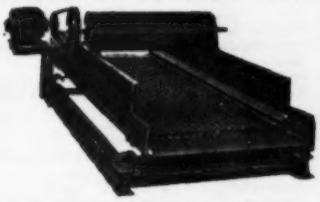

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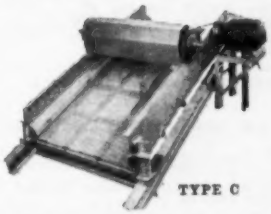

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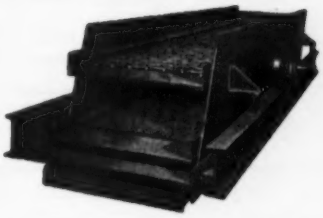

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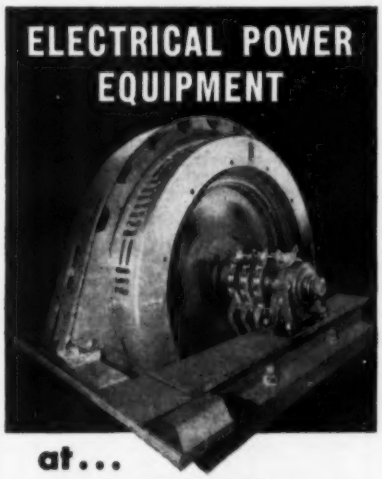

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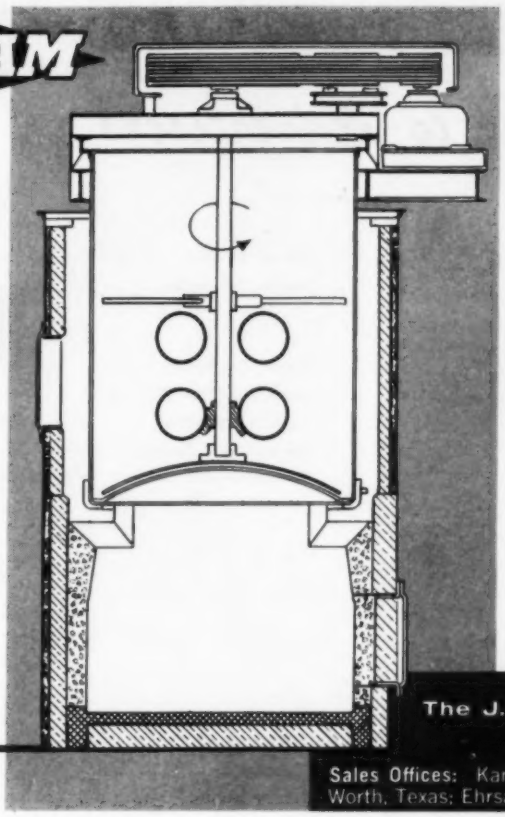

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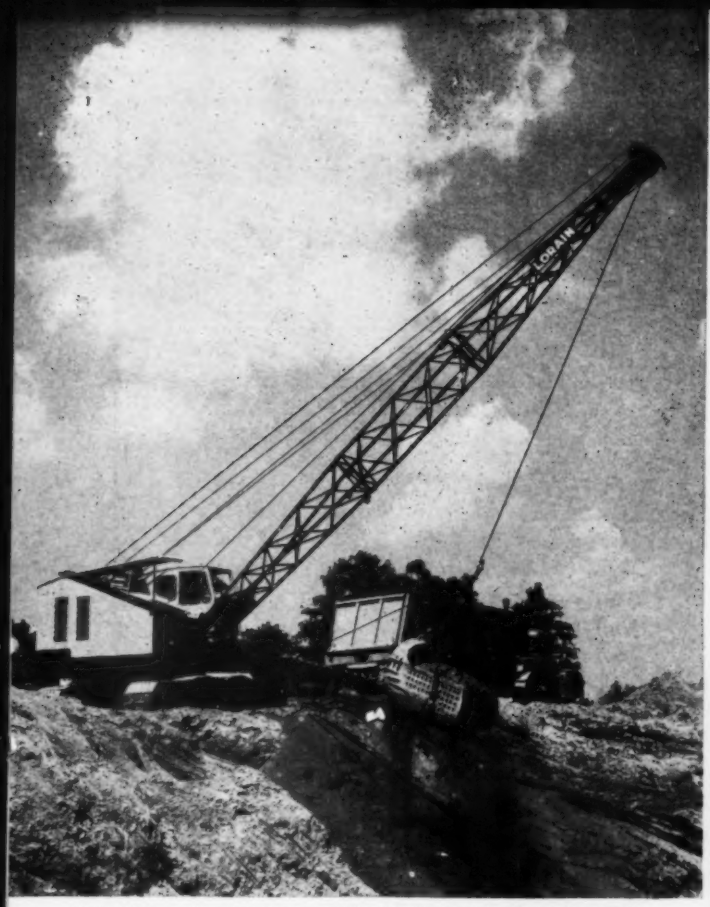

Up to 1100 yards a day are moved by this heavy-duty, ¾-yd. Lorain-26 equipped with a 1-yd. dragline bucket. H. W. Holeman of Glenmora, La. uses his Lorain to load sand, gravel and clay into ten 15-yard trucks. Material is used for a highway shoulder widening project near Eunice, La.

Lorain 1¾ yd. ML-153 Moto-Loader loads 5-yd. trucks in 1½ minutes. Working for Brown Sand & Gravel Company of Brantford, Ontario, this rugged Moto-Loader handles pit run gravel from glacial drift . . . fills trucks which carry the material to a washing and crushing plant.

FAST LOADING FROM PIT TO TRUCK WITH LORAIN DRAGLINE AND MOTO-LOADER

Progressive pit and quarry operators rely on Lorains for faster loading cycles to increase profits.

In Louisiana, a Lorain-26 dragline is paying off for H. W. Holeman. Lorain's exclusive square-tubular-chord boom permits excellent, wide-radius bucket capacity. Big crawlers designed for superior flotation, eliminate nosing-in. Husky construction, plus easy-to-operate controls make the "26" a high production machine.

In Ontario, a 1¾ yard Lorain Model 153 Moto-Loader speeds output for Brown Sand and Gravel Company. Using Lorain's one-foot travel control, the operator moves forward and backward at any speed he wants, uses both hands for steering or other operations. Balanced weight distribution lets the Moto-Loader carry more without bounce or teeter.

For details see your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®
ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

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*See also Detailed Information in 1959 Pit and Quarry HANDBOOK and/or CONCRETE INDUSTRIES YEARBOOK.

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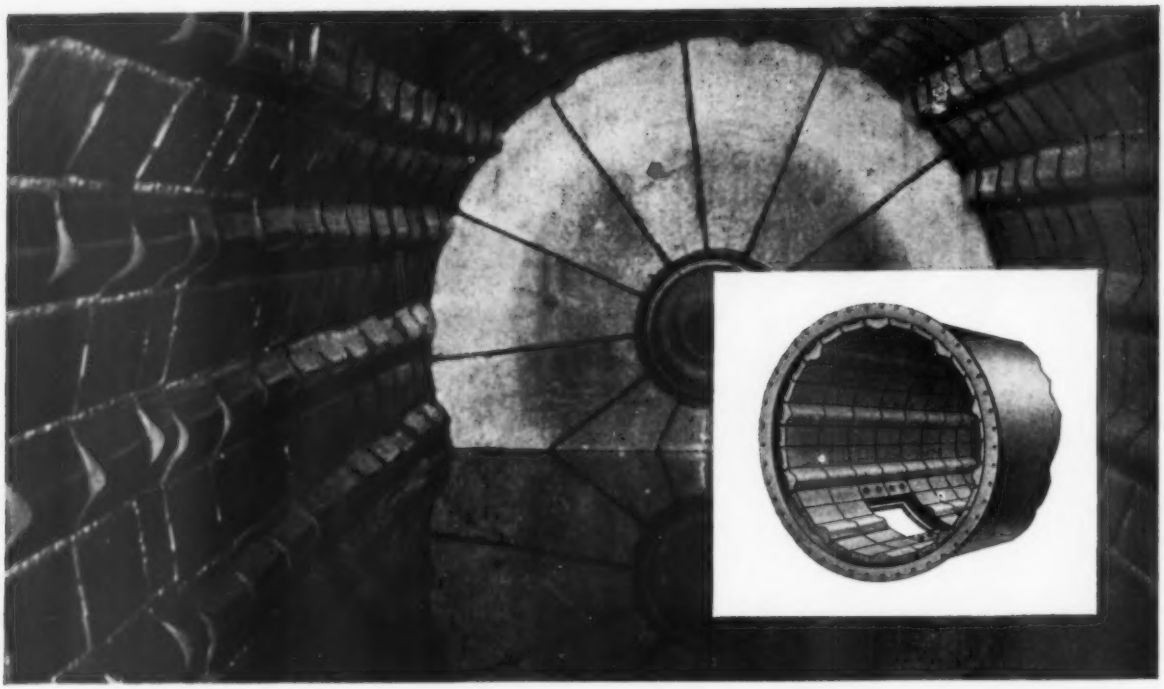
8 miles of Bethlehem rope in aerial tramways. These continuous tramways, containing approximately 8 miles of husky Bethlehem wire rope, are used in the rock disposal system at the coal preparation plant of Omar Mining Company, at Stirrat, W. Va. Rated at 250 tons per hour, the system crosses a mountain to reach the disposal area. The loaded track cables use four pieces of 1¼ in. 1 x 61 extra high-strength tramway strand; the empty track cables have four pieces of ¾ in. 1 x 19 extra high-strength tramway strand. The traction ropes are 1¼ in. 6 x 19 type U preformed improved plow, lang lay, with independent wire rope core.

In this application, as in so many others, Bethlehem wire rope is relied on to give long service. Top quality in every detail, Bethlehem ropes are available in all popular sizes and constructions.

Bethlehem Steel Company, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem wire rope

BETHLEHEM STEEL



8 Reasons Why You Should Standardize with B&W Universal Liner Plates

Better Performance with Lower Costs—Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage—installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all diameters of mills. Standardization means quicker unloading and storage.
7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½″ and 3″ with 1½″ high lifters. Castings are 6″ wide x 12″ long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

S-471

DENVER

Peripheral Discharge MILLS

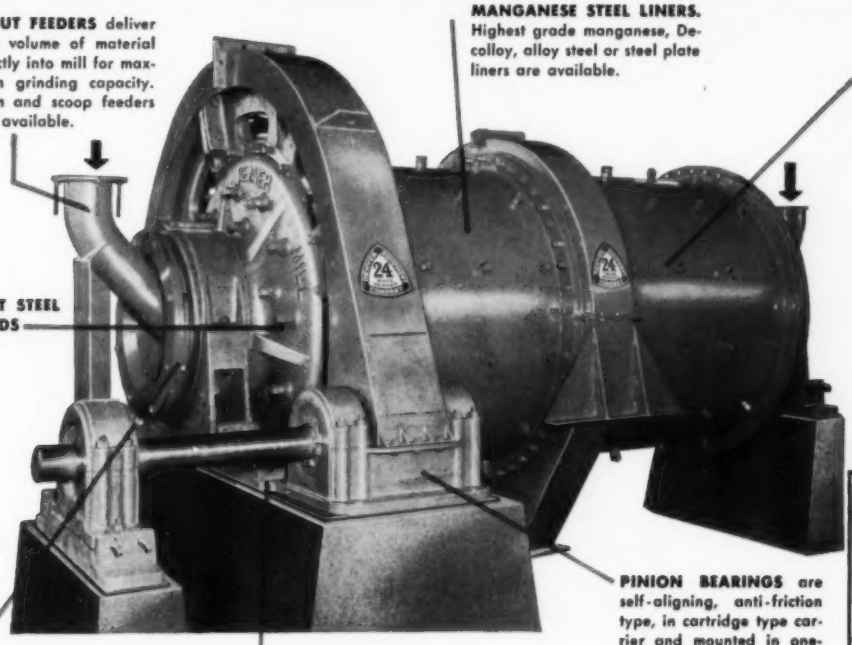
...turn waste or surplus stone into sharp, clean SPECIFICATION SAND— *simple, easy and profitable!*

COMPARE these Distinctive Features

SPOUT FEEDERS deliver high volume of material directly into mill for maximum grinding capacity. Drum and scoop feeders also available.

MANGANESE STEEL LINERS. Highest grade manganese, Decolloy, alloy steel or steel plate liners are available.

GREATER CAPACITY since both mill diameter and length are measured *inside* of new liners (rather than inside the shell).



CAST STEEL HEADS

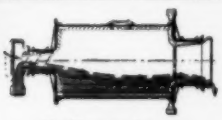
INVESTIGATE OUR LEASE-PURCHASE PLAN

PINION BEARINGS are self-aligning, anti-friction type, in cartridge type carrier and mounted in one-piece housing.

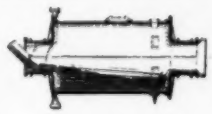
SELF-ALIGNING TRUNNION BEARINGS on large mills are continuously lubricated from oil reservoir in base.

ADJUSTABLE, SINGLE-UNIT SOLE PLATE under trunnion and drive pinions assures perfect, permanent gear alignment.

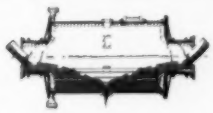
Sizes up to 10' x 20', small and large discharge



Medium or Large Trunnions with or without Grate Discharge



Direct Feed, End Peripheral Discharge

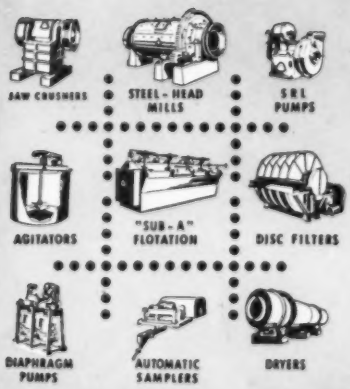


Direct Twin Feed, Center Peripheral Discharge

NO COST TO YOU FOR THIS SERVICE

Find out the exact size of mill you require, its cost, power requirements, production and screen analysis of manufactured sand. Send ¼ cu. yd. sample of material prepaid to Denver Testing Laboratory, 1755 Blake St., Denver, Colo., for preliminary test. There is no charge to you for this service and the information from this test will help you in your decision.

Let us report to you which method of discharge will do the best job for you.



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San Isidro

COMPARE THE NEW

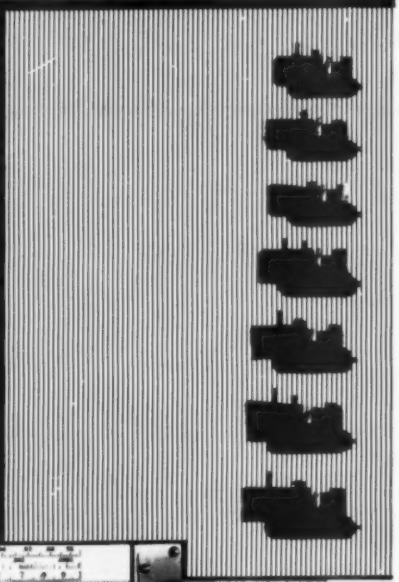
EIMCO 123

FRONT END LOADER! CHECK THE

FACTS

NOT THE CLAIMS

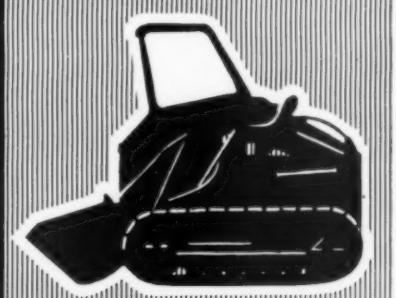
	EIMCO 103	CAT D-4	CAT D-6	AC HD-6	AC HD-11	INT. TD-9	INT. TD-18	CASE 1000
Maximum Drawbar Pull, Pounds (zero track slippage)	33,600	10,700	19,000	15,485	21,980	13,240	23,730	24,000
Torque Converter	Yes	No	No	No	No	No	No	Yes
Master Clutch	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Power shift transmission on all speeds, with oil-cooled metallic clutches that never need adjustment	Yes	No	No	No	No	No	No	No
Independently reversible track	Yes	No	No	No	No	No	No	Yes
Hydraulic track take-up	Yes	No	No	No	No	No	No	Yes
Heat-treated alloy steel grouser shoes, keyed to the track links	Yes	No	No	No	No	No	No	No
One-piece heat-treated alloy steel track rollers, tapered roller bearings	Yes	No	No	No	No	No	No	No
Equalizer bar of heavy duty heat-treated cast alloy steel, allowing full oscillation of crawler tracks with all attachments	Yes	No	No	No	No	No	No	No
Constantly running power take-off drives, front and rear, to standard SAE specs, with rear take-off not affected by track operation, and independent hydraulic pump drive allowing simultaneous use of hydraulic, winch and hoist accessories	Yes	No	No	No	No	No	No	No
Front operator's seat for full visibility	Yes	No	No	No	No	No	No	No
Ability to operate forward and backward on up to 90% slopes	Yes	No	No	No	No	No	No	No
Tractor guaranteed for one full year of single shift service	Yes	No	No	No	No	No	No	No



FOR PROOF OF EIMCO 123 SUPERIORITY

FRONT END LOADERS	EIMCO 123	CAT 955	CAT 977	AC HD6G	AC HD11G	INT. 9K3	INT. 15K3	CASE 1000
WEIGHT, POUNDS	25,000	22,470	34,915	19,600	32,000	19,985	33,235	21,800
ROCK BUCKET, CU. YARDS	1¼	1.1	1.8	1½	2¼	1½	2¼	N.A
ENGINE HP	100	70	100	72	111	71	115	100
TRACK GAUGE, INCHES	60	60	74	60	74	60	74	60
SHOE WIDTH, INCHES	17	15	18	13	16	13	18	16
LENGTH OF TRACK, INCHES	88	81½	105⅛	83⅛	106¾	75	98½	79
TRACK AREA, SQ. INCHES	3,000	2,450	3,814	2,180	3,410	2,250	3,546	2,530
GROUND PRESSURE, PSI.	8.3	9.2	9.2	9.0	9.4	8.9	9.4	8.6
LIFT HEIGHT TO HINGE PIN, INCHES	144	128	144	120	139	125	144	134
DUMP HEIGHT, INCHES	115	100	114	96	114	102	113	101
DUMP REACH, INCHES	44	38½	39	31	37	26	37	40
MAX. DUMP ANGLE, DEGREES	63	50	50	45	52	60	58	50
MAX. PUMP PRESSURE, PSI	1,200	1,450	1,450	1,000	1,300	1,500	1,750	1,450
PUMP, GPM	75	43	52.5	39	72	N.A	N.A	50
LIFT TIME, SEC.	7.5	7.0	9.1	9.0	9.0	7.7	9.0	7.5
DUMP TIME, SEC.	3.0	4.0	5.0	4.0	4.0	N.A	N.A	1.6
GROUND CLEARANCE, INCHES	17	13⅜	19¼	11⅜	13⅜	9	10	16

N.A. — not available



Information is from manufacturer's data and other sources believed to be reliable, but cannot be guaranteed.

IT'S A FACT . . . not a claim . . . that here is a MODERN line of tractors that makes all other crawler-tractors old-fashioned!

Other exclusive features includes Unitized "Stress Flow" Construction, for far greater strength and rigidity; Self-cleaning Air Cleaner that completely eliminates ordinary routine cleaner maintenance and others, far too numerous to list here. Write for details and specifications on all the advanced engineering features of the modern Eimco 103 line of crawler tractors.

AVAILABLE IN FOLLOWING MODELS:

103 — TRACTOR AND DOZER
123 — FRONT END LOADER
133 — STEEL MILL FEL
143 — LOG LOADER

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

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